THE BRITISH JOURNAL

OF

TUBERCULOSIS

Vol. I. July, 1907. No. 3.

EDITORIAL.

TUBERCULOSIS IN INFANCY AND CHILDHOOD.

TUBERCULOSIS takes heavy toll from the children. In all civilized countries childhood suffers irreparable loss and incalculable damage from the ravages of the tubercle bacillus. The extent of the evil cannot be adequately expressed by statistics. There is good reason to believe that the prevalence of tuberculosis during child life has often been overlooked, and its importance generally underestimated. Certainly the systematic study of the disease in early life has been woefully neglected. We still grope hesitatingly for want of knowledge. Concerning the pathology of tuberculosis when attacking the tissues and organs of the young, our information is scanty and imperfect. Widely divergent views prevail as to the relative importance of ætiological factors. Even our perception of the clinical characteristics of tuberculous affections occurring during the initial years of life lacks in precision and completeness. Measures for organized and effective effort, whereby adequate prophylactic care may be available for the young, are few and feeble. Great Britain and America, and indeed most countries, with the honourable exception of France, have to acknowledge that no comprehensive and scientifically directed movement exists for the study of tuberculosis in childhood and the establishment and maintenance of special hospitals, sanatoria, and homes for tuberculous and tuberculously disposed children.

Attention has very rightly been directed to the necessity for pro-

viding working men and women smitten by tuberculosis with sanatoria where they may win their way back to health; and in Germany, and now in this country and America, considerable expenditure is being incurred in attempts to restore tuberculous adults. Unfortunately, few have realized the importance of caring for the consumptive child, or recognized the urgent necessity for protecting the predisposed little ones from falling victims to tuberculosis. Suitable institutions for consumptive and other tuberculous children are in this country and America deplorably few and conspicuously feeble. The children's hospitals, in which many little tuberculous patients have been compelled to seek refuge, are usually urban institutions quite unsuited to the carrying out of an all essential hygienic treatment. Professor Emmett Holt, whose authority in matters concerning child life none can dispute, has justly urged: "If fresh air and a proper climate are necessary for the cure of this disease in adults, they are tenfold more necessary in the case of children. . . . Nowhere do these cases do so badly as in a hospital located in a city, and no class of hospital cases do worse than these."

Not only are country sanatoria and fresh-air hospitals required for rational medical and surgical treatment of tuberculous children, but there is urgent need for systematic educational effort, whereby parents, nurses, teachers, and particularly those who in the near future will be the nation's citizens, shall be definitely instructed in the principles and practices of the hygienic life. Sound knowledge concerning that which is hygienically right and hygienically wrong affords the surest means for the conduct of a successful anti-tuberculosis campaign.

Every school-child should be periodically submitted to capable medical examination, so that the predisposed may be guided along such paths as will develop the greatest powers of resistance to tuberculosis. All tuberculous children must be effectively dealt with at the earliest possible opportunity.

In the present issue of this Journal we have attempted, with the valuable assistance of many experts both at home and abroad, to collect and to connate available knowledge bearing on the problem of Tuberculosis in Infancy and Childhood. It is hoped that the numerous and varied articles in this Children's Number, viewing the problem as they do from many different standpoints, may prove of much practical service in indicating means and measures whereby advancement may be made in our armament for the protection of infancy and childhood from tuberculosis, and the proper care of those little ones suffering from or crippled by the ravages of this devastating disease.

SPECIAL ARTICLES.

THE PRESERVATION OF CHILDREN AND ADULTS FROM TUBERCULOSIS IN AMERICA.

Historical Review of the Anti-Tuberculosis Movement in the United States.

By S. A. KNOPF,

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AMERICA is rapidly learning how to organize and maintain its forces in the strenuous combat against tuberculosis. A study of the past affords the best preparation for the future.

The first private sanatorium for tuberculous patients in the United States was started by Dr. J. W. Gleitzmann some thirty years ago (1875). It was followed some years later (1884) by the establishment of the first sanatorium for the consumptive poor through the personal efforts and devotion of Dr. E. L. Trudeau, of Saranac Lake. The first sanatorium established near a large city and without regard to special climatic advantages was the Sharon Sanatorium, near Boston, which was opened in 1890. It owes its existence to the enthusiasm and personal work of Dr. Vincent Y. Bowditch. The construction of the first State sanatorium for consumptives was authorized by an Act of the Legislature of the State of Massachusetts in 1895. It is situated at Rutland, Mass., and was opened for the reception of patients in 1898.

Particularly during the past five years, numerous private, State, and municipal sanatoria have been established in many of the States of the Union. Many additional ones are projected or are in course of construction.

In 1903 there was originated at Lake Kushaqua, N.Y., an institution called the Stony Wold Sanatorium, which is unique of its kind. It owes its inception to the wives of two New York physicians, Mrs. James E. Newcomb and Mrs. George E. Shrady, and is devoted exclusively to the treatment of consumptive children and working women, and is maintained mainly by noble-hearted women of wealth.

America, like England, has been slow in caring for consumptive and other tuberculous children.

The first seaside sanatorium for tuberculous and scrofulous children, called Sea Breeze, and situated on Coney Island, was established as recently as 1904 by the Society for the Improvement of the Condition of the Poor.

An immediate extension of effort and enterprise is urgently required if we are to secure adequate provision for the protection and treatment of tuberculous and tuberculously disposed children throughout the country.

The first dispensary class in the United States, devoted exclusively to the treatment of tuberculosis, was inaugurated in 1894 by Dr. Edward J. Bermingham at the New York Throat and Nose Hospital.

The first municipal dispensary for the treatment of the consumptive poor was opened by the city of New York under the name of the Clinic for Pulmonary Diseases of the Health Department. It was established mainly through the initiative of Professor Hermann M. Biggs, the general medical officer of the city, and started work on March 1, 1904. Since then, dispensaries for tuberculous patients have been opened in many of the larger cities of the United States.

The first Federal sanatorium was founded upon the recommendation of Surgeon-General Wyman, of the Marine Hospital Service, at Fort Stanton, New Mexico, in 1899. Since then the United States War Department has organized an institution for tuberculous soldiers at Fort Bayard, in the same State.

The first "day sanatorium," where patients are cared for from eight in the morning until five in the evening, was opened on Parker Hill, Boston, in the summer of 1905, under the auspices of the Association for the Relief and Control of Tuberculosis of that city.

The first society for the prevention of tuberculosis was the Pennsylvania Society, founded in 1892 by Dr. Lawrence F. Flick, who was also its first president. This society was the only active organization in the United States until five years ago.

The first tuberculosis committee of the Charity Organization Society doing educational and relief work was founded in 1902, largely through the efforts of Professor Edward T. Devine, Ph.D., the general secretary of the Charity Organization Society, and the tuberculosis committee's first secretary.

To-day there are at least fifteen State organizations, and sixty city societies or committees, all devoted to spreading the gospel of the preventability and curability of tuberculosis.

In 1893 a system of partial voluntary and partial compulsory reporting of tuberculous cases was adopted in the city of New York,

upon the recommendation of Dr. Hermann M. Biggs, of the Board of Health. Public institutions were required to report cases coming under their supervision, and private physicians were requested to do this. In 1897 the same Board of Health adopted regulations making the notifications of all cases of tuberculosis obligatory.

An executive order was issued by President Theodore Roosevelt, February 28, 1906, with a view to prevent the spread of tuberculosis among the employés of the Government.

The first tuberculosis exhibition was held in Baltimore in January, 1904, under the joint auspices of the Tuberculosis Commission of the Maryland State Board of Health and the Maryland Public Health Association. This exhibition was an objective presentation of the history, distribution, varieties, causes, cost, prevention, and cure of tuberculosis. The next most important tuberculosis exhibition was held in New York from November 27 to December 9, 1905, at the Natural History Museum. The exhibition was organized by the National Association for the Study and Prevention of Tuberculosis and the Committee on the Prevention of Tuberculosis of the Charity Organization Society of New York. Like the Baltimore exhibition, it was planned as an educational measure in the widespread campaign against tuberculosis. It showed by means of models, photographs, charts, diagrams, etc., the main facts with regard to the disease, its prevention and cure. Co-operation from all parts of the country had been enlisted, and a comprehensive demonstration of the facts had been installed. On the opening evening addresses were given by the Mayor of the City of New York, the Hon. George B. McClellan; by Dr. Thomas Darlington, the Commissioner of Health; and by President Morris K. Jesup, of the American Museum of Natural History. Since then the same exhibition has become a travelling one, and up to this date it has been shown in Boston, Philadelphia, Newark, Indianapolis, Chicago, Milwaukee, Grand Rapids, Manistee, Detroit, Toronto, Cleveland, Cincinnati, Mexico City, San Antonio, Minneapolis, St. Paul, and Providence. The attendance at these exhibitions has totalled nearly five hundred thousand. Smaller exhibitions, organized by local committees, have been held in various cities and towns, and have materially helped in spreading much-needed information concerning means for preventing and measures for securing the arrest of tuberculosis.

Four journals published in the United States are largely devoted to spreading information concerning the antituberculosis movement and sanatorium matters. These are: *Charities and the Commons*, published in New York under the direction of the Charity Organization Society; *The Journal of Outdoor Life*, published at Trudeau, N.Y., under the auspices of the Adirondack Cottage Sana-

torium; *The Open Air Quarterly*, published by the Open Air Quarterly Company at the Pembroke Sanatorium, Concord, N.H.; and *The Vanguard*, a monthly bulletin of the Kentucky Antituberculosis Association.

As the culmination of the work done by many lay and medical men and women devoted to the noble cause, the American National Association for the Study and Prevention of Tuberculosis was established at a meeting in Philadelphia in March, 1904, and the organization completed in June of that year at the time of the meeting of the American Medical Association at Atlantic City. Dr. Edward L. Trudeau was elected President; Drs. William Osler and Hermann M. Biggs, Vice-Presidents; Dr. Henry Barton Jacobs, Secretary; and General George M. Sternberg, Treasurer of the Association. Among the Honorary Vice-Presidents the association has the good fortune to count the Hon. Theodore Roosevelt, President of the United States, and the Hon. Grover Cleveland, ex-President. This society, which welcomes as members men and women from all ranks of life who are interested in the solution of the tuberculosis problem, has its offices in New York City, in the United Charity Building, 105, East Twenty-second Street. Its present Executive Secretary is Professor Livingston Farrand, M.D.

The first institute for the study, treatment, and prevention of tuberculosis was founded in Philadelphia, Pa., 1903. It owes its existence to the sagacious munificence of the well-known philanthropist, Mr. Henry Phipps, formerly of Pittsburg, now of New York.

A second Tuberculosis Institute, with purposes similar to those of the Phipps Institute, was established in Chicago in 1906, mainly through the efforts and enthusiasm of Dr. Arnold C. Klebs, who is now the head of the educational department of that institution.

The medical profession of the United States was officially represented for the first time at any International Tuberculosis Congress at the British Congress on Tuberculosis in London, 1901. Among those who represented this country on that occasion and those who were honoured by being elected as Vice-Presidents were Drs. Frank Billings, W. J. Councilman, Charles Denison, George Dock, W. A. Hare, H. J. Hartz, A. Jacobi, E. G. Janeway, H. M. King, H. P. Loomis, J. H. Musser, Edward O. Otis, Arthur Rowley Reynolds, M. P. Ravenel, F. C. Shattuck, G. B. Shattuck, E. S. Solly, A. K. Stone, Arthur R. Thomas, J. Tyson, S. Weir Mitchell, W. H. Welch, J. C. Wilson, and others.

At the International Tuberculosis Congress, convened in Paris in 1905, the American medical profession was represented by an official delegation appointed by the President of the United States, consisting of Drs. Beyer, Flick, Jacobs, and Knopf. There were also delegates

from the various medical centres, among whom were such men as Brannan of New York, Lowman of Cleveland, McCarthy and Walsh of Philadelphia, Pottenger of Los Angeles, etc. At the closing session of this congress an invitation was given to hold the next Tuberculosis Congress in Washington in the fall of 1908. This will be the first time that this distinguished body will honour our country by its presence, and the American medical profession, as well as the public at large, rejoice in the distinction and the prospect of welcoming in our capital those workers from all parts of the world who are engaged in the universal war against the Great White Plague.

MEASURES EMPLOYED IN GERMANY FOR THE PREVENTION AND TREATMENT OF TUBERCULOSIS IN CHILDREN.

By ADOLF BAGINSKY,

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In the present great campaign against tuberculosis, which has now assumed international proportions, the determination of sound lines upon which it should be conducted is a matter of the gravest significance to the entire civilized world. Here in Germany, under such legislative measures as govern the social conditions of our working classes, it has been possible to reduce part of the risk of infection among the poor by isolating the tuberculous sick in suitable sanatoria. But it is only after a comparatively long interval that definite precautions have been introduced against the development of tuberculosis in children. It was early recognized, however, that the wide prevalence of the disease among children and the resulting high death-rate formed a sinister factor of equal, if not of greater, importance in estimating the well-being of the nation than that furnished by the percentage of illness among adults. Hence the treatment and prevention of tuberculosis among children is acknowledged to be a measure of the utmost strategic importance in the campaign against this deadly disease.

Tuberculosis is very rife among children in Germany. At the last International Congress upon Tuberculosis, Dietrich estimated that from 1876 to 1905 the proportion of deaths to every 10,000 of the population was in Prussia alone as indicated in the following table:

TABLE SHOWING THE PREVALENCE AND PROPORTION OF DEATHS FROM TUBERCULOSIS AND OTHER CAUSES IN PRUSSIA AMONG INFANTS AND CHILDREN.

Age.	General Causes.	Tuberculosis.	Deaths from Tuberculosis per Hundred.
Under 1 year	7,294,755	103,484	1·4
1 to 2 years	1,846,560	86,335	4·6
2 to 3 years	865,811	48,834	5·6
3 to 5 years	506,625	26,479	5·2
5 to 10 years	220,182	16,898	7·6
10 to 15 years	106,106	21,406	20·1

The above figures seem to show a steady rise, to which the mortality resulting from tuberculosis among children is no small contributing factor.

The question of the mortality from tuberculosis among children was first thoroughly discussed by two physicians of note—namely, Dr. Robert Koch and Dr. von Behring. They have approached the subject, however, from widely different points of view. Dr. Koch lays particular stress upon the transmission of the disease by contagion, especially by means of the respiratory organs. Dr. von Behring, on the contrary, is of the opinion that tuberculosis is principally disseminated through the alimentary canal, and he sees a fruitful source of danger to children in the tuberculous nature of much of our milk-supply.

In the light of these facts there is small cause for wonder that, although the general measures against the spread of tuberculosis in Germany are rigorous in the extreme, efforts should have been redoubled in the attempt to cope with the disease during childhood. The measures adopted are twofold, aiming, on the one hand, at the treatment and cure of those already affected, and, upon the other, at the prevention of disease, or at least its limitation, to the smallest possible extent.

Therapeutic Considerations.

The greater number of hospitals in Germany are now prepared to receive tuberculous children for treatment. The method rests upon general hygienic and therapeutic principles, reinforced latterly in special cases by Koch's tuberculin. At the Kaiser and Kaiserin Friederich Hospital for Children in Berlin, out of 12,000 children who came under treatment within the last few years, some 600 (that is, 5 per cent.) were suffering from tuberculosis. Among these a large

proportion were cases of tuberculosis of the bones. In a few isolated cases pure tuberculin was employed. In general, however, creosote preparations were preferred, and in the slighter forms of the disease definite results were achieved.

At present we possess only two sanatoria exclusively for children. The one at Belzig, near Berlin, was founded by the Berlin-Brandenburger-Helstätten-Verein, and has accommodation for thirty children. The other is the Victoria Louise Hospital for Children at Hohenlychen, with accommodation for fifty inmates. Both sanatoria are situated among wooded surroundings, and are provided with every modern comfort. The dormitories, dining-rooms, and day-rooms are large, airy, and well-lighted. In connection with the hospital at Hohenlychen is the Cecilia Home for the treatment of tuberculosis of bones and joints. Its management is in the hands of Professor Hoffa.

There are also a considerable number of mineral-water stations and seaside resorts where tuberculosis cases are received. The relative importance of such stations in the management of tuberculosis has as yet been but imperfectly studied. They are of undoubted value in the treatment of scrofula, and in this way they enter indirectly as prophylactics into the field of tuberculosis. Germany is particularly rich in springs containing chloride of sodium, and at every brine spa a special building is reserved for the use of sick children. Among many such health resorts the following deserve mention:

Alstaden, in the Rhine Province; Dürkheim, in the Rheinish Pfalz; Elmen, in Saxony; Frankenhausen, in Thuringia; Harzburg, in the Harz; Kissingen, in Bavaria; Königsdorf-Jastrzemb, in Silesia; Kösen, in Thuringia; Kreuznach, in the Rhein Province; Münster-am-Stein; Nauheim, in Hessen; Orb, in Hessen-Nassau; Reichenhall, in Bavaria; Rothenfelde, in Hanover; Salzdettfürth, in Hanover; Salzufflen, in Lippe; Salzungen, in Thuringia; Schwartau, in Oldenburg; Soden, in the Taunus; Suderode, in the Harz; and Salza.

Marine health resorts possess only a secondary value in the management of tuberculosis. Tuberculous patients do not, as a rule, do well at the seaside, and, indeed, definite harm may be done by marine treatment. But in combating the conditions which predispose to tuberculosis, such as malnutrition, scrofula, etc., seaside stations have a very high value indeed, and their influence in the direction of prophylaxis is inestimable. Among the best-known marine stations suited to the requirements of tuberculous children are Zoppot, near Danzig, Kolberg, Ellerbeck, Heringsdorf, Sassnitz, and Swinemunde, on the Baltic, all of which possess newly-acquired facilities for brine-baths. To these must be added the sanatoria of the Verein für Kinderheilstätte. They are situated at Gross-Müritz and Zoppot, on the Baltic, and Wyk and Norderney, on the North Sea. The Kaiserin Friedrich Sea Hospice at

Norderney has accommodation for 400 children, with special arrangements for the treatment of thirty scrofulous cases. It is not, however, a tuberculosis station. Such patients do not do well there, and those in whom the disease has passed the preliminary stage are not, as a rule, admitted for treatment. In the management of scrofula, however, it is undoubtedly one of our most efficient sanatoria, and has for this reason a distinct prophylactic value in regard to tuberculosis. The treatment at all the institutions which I have named consists in sea or brine baths, given in combination with a suitable regime which is carried out upon sound hygienic principles, and in which every use is made of favourable out-of-door conditions, whether of forest or of sea. Physical exercises, sun-baths, and, indeed, almost every means, are employed to stimulate and strengthen the enfeebled young organism.

Prophylaxis of Tuberculosis in Children.

It is entirely in accordance with our modern attitude towards tuberculosis that the measures adopted for its prevention should be quite as energetically pursued as those directed towards its arrest and cure. As far as our present knowledge goes, Koch's bacillus is transmitted by contagion from one person to another. For this reason the importance of removing children from the neighbourhood of diseased adults, whose breath and sputa load the atmosphere with infectious germs, cannot be overemphasized. The difficulty lies, however, in getting information as to the whereabouts of such cases. Undoubtedly it would be best to make tuberculosis a notifiable disease, and the isolation of cases compulsory. Failing this, however, we must needs fall back upon less drastic measures, chief among which should be placed the so-called "Fürsorgestellen" for persons suffering from phthisis. The primary object of these excellent organizations is the care of those pulmonary consumptives who are still able to get about. Visits are also made to patients in their own homes, where the dwelling is disinfected, children removed, wherever possible, from dangerous contact, and, by the aid of money gifts, larger and healthier rooms provided. Patients are taught the most efficient means of disinfecting and disposing of their sputa, and how to keep their clothes, beds, furniture, and floors clean. Writing upon this subject, Kayserling states that in Berlin alone 70 per cent. of the cases of phthisis which come under the notice of the authorities result from association with persons whose expectoration contains tubercle bacilli. He adds that the rational methods of the "Fürsorgestellen" are attended by results of which time alone can show the real value. It is a fact beyond all dispute that the improved hygienic conditions brought about by the "Fürsorgestellen" in the dwellings of the consumptive poor constitutes

a powerful factor in limiting the area of disease and diminishing its virulence.

There are two classes of organization which directly benefit children living among infected surroundings. First among these come the *country homes*, started by the late Dr. Becher and Dr. Lennhof, of Berlin. These are simple but suitable buildings, put up somewhere in the woods, where children may be taken and kept for the entire day. Another such home has been opened by Frau von Studt at Eichkampk, and this is provided with sleeping accommodation. At these homes everything is conducted upon strictly hygienic lines, from the proper cleansing of the children to the furnishing of a suitable dietary and the enforcement of physical exercise.

Secondly, there are the *holiday camps* for poor school-children. These camps provide thousands of children with a yearly country holiday. They afford the only opportunity which such children possess of escaping from their tainted surroundings, and of strengthening their enfeebled little bodies with a few weeks spent under hygienic and sanitary conditions.

There is one other institution which deserves mention here—namely, the *forest school*. In the neighbourhood of Charlottenburg (Berlin) a school has been erected in the heart of the woods, where pale, weakly children are kept for months at a time. Here they are taught under the most advantageous conditions, due regard being paid to their state of health.

Convalescent homes in the country, holiday camps, forest schools, and last, but not least, the appointment of qualified school doctors, whose business it is to find out the children threatened by disease and to watch over their health—these are some of the great social schemes which are being carried out in Germany for the prevention and cure of tuberculosis in the young. The means are provided by the State, by the Central Committee for Combating Tuberculosis and by private contribution.

But these things, efficient though they are, do not include all that is being done. Statistics show that tuberculosis plays a large part in the infant mortality of this country. The table above gives 2 per cent. as the proportion of children who succumb to tuberculosis during their first two years of life. This does not include those born of weakly, tuberculous parents, and already affected by disease, who die from other causes. It is essential that something further should be done to mitigate the conditions under which these children struggle for existence. It is not necessary to enter into a discussion of the relationship between human tuberculosis and that of cattle, or to enumerate the differences between the human type and the bovine type of the tubercle bacillus, to be assured of the vital importance of a good and untainted milk-supply. The milk laws in Germany are strict, and the

supply is subjected to careful supervision, but even here more requires to be done. Moreover, it is being constantly pointed out to the general public how dangerous is the practice of feeding infants with contaminated milk. Nevertheless, the law upon this subject needs considerable extension if anything in the nature of real prophylaxis is to be arrived at. At present, however, the obstacles to such a condition of things are many, and not lightly to be overcome.

Scattered through the length and breadth of Germany are numerous infant "Fürsorgestellen," corresponding to the French "Goutte de Lait." Here the children are brought under medical inspection, the parents are instructed and advised, and good sterilized milk is supplied either free or at a very low cost.

I have been able to give here but a short account of what is being done in Germany to combat the tuberculosis scourge. At present we know that in many directions we are only at the beginning of our efforts. We are, indeed, only feeling our way. But the unremitting labour of the scientist, supported by the conscientious co-operation of the State, must before long be attended by results which will very materially affect the health statistics of the country.

THE PREVENTION OF TUBERCULOSIS AMONG CHILDREN IN IRELAND.

By SIR JOHN BYERS,

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It is interesting to note that while in Ireland in 1903 the highest death-rate from tuberculosis occurred among those living at the age-period twenty-five to thirty-five years (and it is to be recollected that in that country, out of every 100 deaths from all causes, 16 were, in 1905, the victims of tuberculosis), in England and in Scotland the highest death-rate from tuberculosis appeared in the population under five years of age. We must with these facts take also the infantile mortality of Ireland, which is low—95 for every 1,000 babies born in 1905; but when we divide Ireland into town and country districts, we find that while in the latter the average infantile death-rate is 79·2, in the towns it is about 144. . It is the small country mortality under one year—due largely to breast-feeding—that keeps the general infantile mortality in Ireland so low. My own experience has been that while in children

we may meet with forms of generalized tuberculosis in the lungs, it is not until they reach about the ages of seven or eight that the chronic pulmonary form of the disease begins to resemble clinically the phthisis of adults; on the other hand, what we constantly observe in children are tuberculous peritonitis, tuberculous meningitis, glandular and bone disease; and my belief is that while the breast-fed infants largely escape any form of tuberculosis, they (and still earlier those who are brought up on the bottle) become infected afterwards through cow's milk. In Ireland it is computed that about 20 per cent. of the cows are tuberculous in country districts, and about 40 per cent. of those in town dairies.

The primary schools in Ireland are in a deplorable condition; overcrowding, insufficient floor-space, insufficient seating accommodation, want of proper ventilation, and no proper provision for encouraging cleanliness and sanitation, are their characteristics (see Report of Commissioners of National Education in Ireland for School Year 1905-1906). Now, it is in such schools, as well as in their own insanitary homes (where advanced cases of phthisis are allowed to remain to a far greater extent than in England and Scotland), that the children, after six years of age, so often begin to inhale the germs of tuberculous infection.

Bearing these points in view, in order to protect the children in Ireland from the ravages of tuberculosis, I would recommend—

1. The encouragement of breast-feeding among the women living in the towns, as well as among any of those residing in the country districts, who do not do so.

2. Complete control on the part of the State and the various urban and rural authorities of the milk-supply. Modern clean dairying, under medical and veterinary inspection, with the elimination of cows infected by tubercle, should be obligatory, and dairies in the centre of large, densely-populated towns should be removed.

3. There should be proper management of the hygiene of the primary schools as to ventilation, overcrowding, and sanitary arrangements, and the pupils should be taught more of the elementary principles of hygiene. I hope in time medical inspection both of the school premises and of the children will become compulsory.

4. The dwelling-houses in the towns and in the country districts should be made more sanitary. Ireland has not, in this respect, passed through the sanitary house reform which has occurred in England and in Scotland, and which has done much to lower the death-rate from phthisis in these countries.

5. All advanced cases of phthisis should be segregated and treated in institutions, and not in their homes, where the other dwellers there, including the children, may be infected by them.

6. Finally, to get right into contact with the people for educative

purposes, the Women's National Health Association of Ireland,[1] established in March, 1907, by Her Excellency the Countess of Aberdeen, wife of the Viceroy, is, I believe, a scheme which, if thoroughly taken up, will be a most important element in solving the problem of how to protect the children from tuberculosis. During the preliminary period, while the Association is being organized, all correspondence may be addressed to the Countess of Aberdeen at the Viceregal Lodge. The object of the Association is to arouse public opinion, and especially that of the women of Ireland, to a sense of their responsibility regarding the public health, and to spread the knowledge of what may be done in every home and by every householder to guard against disease and to promote the upbringing of a healthy and vigorous race. The questions specially to be dealt with by this organization are consumption, infantile mortality, milk-supply, and school hygiene. I trust fellow-countrymen and countrywomen will join in this new campaign to save our race from extinction. This splendid crusade is essentially a work for women; it is being led by one of the most accomplished, trusted, and honoured of their sex, and by one who previously did such a splendid work in establishing those industries which have found employment and brought better means of living for many in Ireland. This latest scheme of Lady Aberdeen's will be the means of saving, if properly and enthusiastically taken up by the people, the lives of thousands of their fellow-beings in Ireland.

THE PROTECTION OF CHILDREN FROM TUBERCULOSIS IN SCOTLAND.

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In Scotland, as elsewhere, the antituberculosis campaign, as at present organized, proves incomplete. It fails to embrace any broad, comprehensive action for the prophylactic and curative treatment of tuberculosis in children. That there exists an urgent call for organized effort in this direction is shown by a glance at the certified causes of deaths in Scotland during the year 1905.

The following statement gives the age incidence of deaths from tuberculosis in eight of the principal towns of Scotland:

[1] Full particulars of the work of the Women's National Health Association of Ireland may be obtained from Mrs. A. Rushton, Organizing Secretary, 58a, Rathmines Road, Dublin.

Form of Tuberculosis.	Ages (in Years).		
	1 to 5.	5 to 20.	Over 20.
Pulmonary tuberculosis and deaths certified as due to phthisis	108	411	2,055
Tuberculous meningitis	383	117	17
Tuberculous peritonitis and tabes mesenterica	245	123	56
General tuberculosis	116	114	77
Tubercle of other organs	18	54	55
Total	870	819	2,260

It must be admitted, however, that these figures, significant though they be, are yet inadequate in the conception they yield regarding the prevalence of tuberculosis amongst the young in the towns to which they refer.

Prophylactic Measures.

The measures at present adopted, which have a direct bearing on prophylaxis, are principally those employed for the protection of the general public from tuberculosis and for the lessening of the death-rate from various forms of disease amongst young children. The various branches of the National Association for the Prevention of Consumption are doing good work in disseminating knowledge on the subject of prophylaxis by means of lectures and the distribution of leaflets. The health authorities in the larger towns are becoming keenly alive to the necessity of combating the high death-rate from disease amongst young children. For this purpose infants' milk depots are being instituted, where sterilized milk can be procured by the poorer classes for infant-feeding. This, *if taken advantage of*, will very materially minimize the risk of infection by tubercle in bottle-fed children. In Glasgow there is a subcommittee on infantile mortality, and part of the work it has taken in hand is the organizing of a system of district visitation by ladies and class instruction to mothers in the care and feeding of their children. A medical lady has also been appointed by the Corporation, whose duties have special reference to the feeding and hygienic conditions of infants and young children. The Anderston Health Association has adopted the bounty system as a means of dealing with the high death-rate amongst infants.

In addition, various philanthropic agencies in the larger towns feed necessitous children and secure for them admission to seaside homes and residence in the country, all of which will help, to some extent, in

combating the tuberculous scourge. It will be seen, however, that the prophylactic measures employed are not directly aimed at tuberculosis, and that much in the way of preventive treatment still remains to be done.

Curative Treatment.

From the view-point of treatment, the most important manifestations of tubercle in childhood are the pulmonary form and disease of bones, joints, and lymph-glands. For pulmonary tuberculosis in children little provision has been made in the way of open-air treatment. In the larger towns treatment for the most part consists of advice and medicine obtained at the various dispensaries. In Edinburgh the Royal Victoria Dispensary for Consumption is especially to the fore in the outdoor treatment of tuberculous cases. In that city all poor children suffering from pulmonary tuberculosis are treated in hospital. At Bridge of Weir a small block with twenty beds will shortly be opened for the treatment of children with phthisis between the ages of five and fifteen. This block, with the consumption ward in the Children's Hospital, will allow of thirty beds being reserved for this special purpose.

Children with tuberculosis of bones, joints, glands, etc., usually receive treatment at the dispensaries or in the general hospitals. But, in addition, there is connected with the Royal Hospital for Sick Children in Glasgow a country branch at Drumchapel, to which specially selected cases are sent from the hospital. Here forty-seven children suffering from tuberculosis were treated during the year 1905, the average duration of residence being 127 days. At Prestwick there is a hospital home for cripple children, most of whom are suffering from rickets or tuberculosis. The treatment consists of fresh air, nourishing food, cod-liver oil, general tonics, etc., and the number so treated last year was 439. There is also a small open-air hospital at Aberfoyle, where cases of surgical tuberculosis in children receive treatment on rational open-air lines. This comprises the work being carried on at present in Scotland for the protection of children from tuberculosis.

DISCUSSION.

TUBERCULOSIS AND THE CHILD.

TUBERCULOSIS is the great scourge of child life. This special number is a plea and an argument for an advance in our methods and measures for the prevention and treatment of tuberculous disease in infancy and childhood.

In Great Britain and America, and, indeed, in all civilized countries, children, not only in the hovels of the poor, but in the homes of the rich, are being mortally stricken or permanently crippled by tuberculous affections to an extent but little realized. It is commonly claimed that children are the most valuable asset of a people, and yet this disease, with its suffering for the little patient, its far-reaching anxieties for the home, and its incalculable loss to the nation, is permitted to ravage without anything like systematized and scientifically directed efforts to secure adequate resistance or reasonable means for restoration.

"Every year in the United Kingdom there are some 700,000 deaths and some 1,200,000 births . . . fully one-fourth to one-third of the 1,200,000 are born to want and squalor."[1]

Living under conditions lacking in almost all hygienic essentials, it is not surprising that large numbers of children become tuberculous. Autopsies on children dying from all causes under fifteen years of age show the presence of tuberculosis, estimated by various observers at from 14 to 40 per cent.[2]

No returns can express the extent and widespread influence of the malady. "It cannot be said with any accuracy what proportion of our child population suffers from tuberculosis, and statistics cannot be of much value on account of the impossibility of diagnosing tuberculosis of the internal organs, especially in the milder forms."[3]

Professor Grancher states that in the scholars of the primary schools of Paris a characteristic predisposition to tuberculosis exists in 15 per cent. of the children. As far as can be estimated in this country, something like 25 per cent. of the children in public orphanages, either by inheritance or otherwise, should be considered as predisposed to

[1] "Riches and Poverty." By L. G. Chiozza Money. Third edition. London: Methuen and Co. 1906.

[2] "The Diseases of Infancy and Childhood." By Professor L. Emmett Holt, M.D. Third edition. London: Sidney Appleton. 1897.

[3] "The Diseases of Children." By Henry Ashby, M.D., F.R.C.P., and G. A. Wright, B.A., M.B., F.R.C.S. Fifth edition. London: Longmans, Green and Co. 1905.

tuberculous disease. Tuberculosis must truly be viewed as a part of the great social problem which has to be solved by civilized States.

Of recent years there has been a tendency to discount the importance of heredity in the causation of tuberculosis, and to dwell on its infectivity. It is now, however, being more generally recognized that tuberculosis is to be regarded as a "sub-infectious" disease, and that the nature of the soil is as important as the character of the seed. It would even seem as though the milk of a nursing tuberculous woman exercised prejudicial action. Desirable as it might be to separate a child from a tuberculous mother and an insanitary environment, such cannot be considered practicable measures except in exceptional cases.

Much, however, may be done to improve the hygiene of the home. Biermer called tuberculosis "a bedroom disease," and many a child is dragged up during the most important period of its growth in confined, airless, dark, unwholesome dwellings.[1] The nursery of the wealthy, as well as the one-roomed tenement of the indigent, is commonly lacking in hygienic necessities. Many of our public schools are veritable forcing houses for tuberculosis, and not a few teachers, as well as scholars, fall victims. The profession, the public, the parent, and the patient, all need education in regard to this matter.

Medical examination of schools and scholars may accomplish much if conducted thoroughly and by experts. But the early diagnosis of tuberculosis is beset with numerous difficulties, and a mere perfunctory or casual inspection will accomplish little. The general public seem to fancy that by the provision of sanatoria and the suitable disposal of sputa tuberculosis may be speedily eliminated. There is much need for a widening of outlook, a deepening of knowledge, and a more rational direction of conduct in seeking a solution of the tuberculosis problem.

The evidence presented at the last International Congress on Tuberculosis went far to show that tuberculosis is almost always contracted by the child about the family hearth.[2] Many hold that tuberculosis developing in the adult is oftentimes dependent on a long, latent, and unrecognized infection in infancy and childhood. Be this as it may, certainly one of the surest ways to stamp out tuberculous disease is to provide adequate care and rational protection for the child.

Careful study must be made of all the possible channels of infection,[3] and safeguards secured.

[1] "Tuberculosis and Children," by A. Jacobi, M.D., in "A Handbook on the Prevention of Tuberculosis." New York: The Charity Organization Society. 1903.

[2] See Recommendations adopted by the International Congress on Tuberculosis, Paris, October, 1905. Translation by Dr. Joseph Walsh, *Journal of the Outdoor Life*, May, 1907.

[3] Bovaird, David, jun.: "The Portals of Entry and Sources of Infection in Tuberculosis in Children." Transactions of the Second Annual Meeting of the National Association for the Study and Prevention of Tuberculosis. Lancaster, Pa., U.S.A. 1906.

Practitioners require instruction respecting the differences which distinguish tuberculosis in childhood from that in adult life.

There is immediate need for the establishment of suitable sanatoria for consumptive and other tuberculous children. France has for long sought to provide for the consumptive and tuberculous young, particularly by the establishment of marine health stations.[1] Germany is now moving, notably in the founding of forest and other hygienic schools for its tuberculous and delicate scholars.

But little effective help has been rendered the tuberculous child in England and America. Some slight beginnings have been made in this country, and important developments are projected. Certain sanatoria primarily intended for adults now admit children.[2] Experience has shown, however, that it is not desirable to have adults and children as patients in the same building.

Pulmonary tuberculosis occurs in young subjects much more frequently than is generally supposed.[3]

The early recognition of pulmonary disease in children is peculiarly difficult, and usually requires skilled medical examination for its detection.[4]

Clearly, the most rational and effective means for coping with tuberculosis is to begin at the beginning. Enterprise and effort must be concentrated on the care of the children. A rigorous prophylaxis against tuberculosis should be ensured from the earliest day of infancy in the home, in the school, and in all the centres of childhood's activities. Children tuberculously disposed, and those in what is termed the pre-tuberculous stage, should be placed under ideal hygienic conditions in country cottage sanatoria and open-air schools. For the hopeless consumptive child and tuberculous cripple suitable country hospitals and homes must be provided. And all these means and measures for the protection and treatment of child life should be co-ordinated and controlled by a representative and State-directed Medical Board, acting under a responsible Minister of Health.

[1] For descriptions of French and other sanatoria for Children, see "Sanatoria for Consumptives." By F. Rufenacht Walters, M.D. Third edition. London: Swan, Sonnenschein and Co. 1905. See illustrated article on "Tuberculosis in Childhood." *British Medical Journal*, June 11, 1904. Consult: "Le Sanatorum de Saint-Pol-sur-Mer," par A. Vallet. Lille: Imprimerie-Libraire Camille Robbe, 209, Rue Léon-Gambetta. 1906. Also "L'Œuvre de l'Assistance publique contre la Tuberculose" (1896-1905). Paris: Administration générale de l'Assistance publique à Paris. 1905.

[2] The country branch at Northwood of the Mount Vernon Hospital for Consumption and Diseases of the Chest is now taking a few children as patients.

[3] See chapter on "Tuberculosis in Childhood" in "Pulmonary Phthisis," by H. Hyslop Thomson, M.D. London: John Bale, Sons and Danielsson, Ltd. 1906. Consult also: "The Medical Inspection of Children." By W. Leslie Mackenzie, M.A., M.D., and Edwin Matthew, M.A., M.B. Edinburgh and Glasgow: William Hodge and Co. 1904.

[4] See chapter on "Pulmonary Disease in Children" in "Lectures on Diseases of the Lungs." By James Alexander Lindsay, M.D. Second edition. London: Baillière, Tindall and Cox. 1906.

Prenatal Life and Tuberculosis.

By J. W. BALLANTYNE,

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When the frequency of tuberculosis is borne in mind; when, also, it is remembered that it has been clearly shown that diseases due to microbes may be transmitted through the placenta from mother to fœtus, it may seem strange that comparatively few cases of fœtal tuberculosis have been reported. The reasons, however, are not far to seek. It is not, for instance, commonly found that the tubercle bacillus enters the blood-stream, and, therefore, it does not often reach the placenta. I refer to cases of pulmonary tuberculosis. In cases, however, of tuberculosis affecting the abdominal organs and the peritoneum in which pregnancy may occur we may meet with fœtal tuberculosis, and may detect the bacillus in the placenta and in the fœtal tissues. In fact, the recorded cases of antenatal tuberculosis belong mainly to this group. Another cause of the rarity of tuberculosis in the fœtus would seem to be the freedom of the placenta from hæmorrhagic and other lesions in cases of maternal tuberculosis. The absence of such lesions, or, in other words, the healthy state of the placenta, doubtless makes it difficult for infecting germs to pass the barriers which interpose between the maternal and the fœtal circulations. In this respect tuberculosis in the pregnant woman differs widely from syphilis and renal and cardiac disease during gestation. It has to be noted, however, that when the tubercle bacillus does burst through the placental barriers, it finds no difficulty in multiplying in the fœtal tissues; in fact, it finds in them excellent culture media. The observers of cases of fœtal tuberculosis have indeed been struck by the severity of the fœtal lesions, and have been led thereby to compare the malady in its antenatal manifestations to avian tuberculosis.

While it may, therefore, be said that antenatal tuberculosis is a rare malady—and clinical evidence, based upon the state of the infants of tuberculous mothers at birth, supports this conclusion—it by no means follows that a prenatal influence is not exerted by a tuberculous mother upon her offspring. Although antenatal infection with tuberculosis, resulting from the passage of the tubercle bacillus to the fœtus, and due to the development of tuberculous lesions in the latter, may be a very exceptional thing, it is possible that an antenatal infection of a more subtle nature is a commoner occurrence. It may be that microbic products pass the placental barriers and so weaken the fœtal tissues, rendering them more liable to the onslaught of the germs of

tuberculous or other disease. In this way, while tuberculosis itself may not be determined antenatally, the tendency to develop the disease at a later period may be transmitted before birth. The probability of the occurrence of this less immediate and more subtle form of antenatal infection will be increased by the existence of placental lesions due to renal, cardiac, alcoholic, or syphilitic affections. At the same time it must not be forgotten that in speaking of fœtal tuberculosis we are dealing with facts (albeit they are facts rarely observed), while in referring to the antenatal development of a predisposition or tendency to be affected (at a later age) with tuberculosis we are wandering along paths of speculative pathogenesis in which there are few, if any, facts or principles to guide us.[1]

The Channels of Infection for Tubercle in Children.

By JAMES M. BEATTIE,
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Though it is usually very difficult in any individual case of tuberculosis to definitely settle the primary seat of infection, yet the experience of the post-mortem room of a children's hospital leads one almost inevitably to the conclusion that the two main channels of infection are the intestinal tract and the glandular tissue about the pharynx. There may be cases of infection by the skin and by the lower respiratory passages, but these are probably of trivial importance.

The Intestinal Tract.—This is undoubtedly the most frequent channel of infection. The bacilli, which, according to the recent Commission on Tuberculosis, are most commonly of the bovine type, gain entrance by means of milk and other foods. The intestine itself may be attacked and ulceration follow, but, perhaps more commonly, the organisms pass through the intestine and reach the mesenteric and retroperitoneal glands. There they may remain localized, producing tubercle follicles, caseation, etc., or they may become more widely distributed by means of the lymphatics, and set an extensive abdominal or even a general tuberculosis.

The Glandular Tissue about the Pharynx.—The tonsils and adenoids, especially if enlarged, form particularly suitable traps for bacilli either taken in by inhalation or with food. An examination of the enlarged tonsils in children apparently free from tuberculosis shows in quite a

[1] The question of antenatal tuberculosis is dealt with more in detail in the author's "Manual of Antenatal Pathology," vol. i., "Diseases of the Fœtus." Edinburgh: Green and Sons. 1902.

considerable number of cases the presence of tubercle follicles and giant cells, and not unfrequently the bacilli can also be demonstrated. In children with enlarged tuberculous cervical glands evidence of tuberculosis in the tonsils can very frequently be shown.

Tuberculous meningitis is probably in many cases due to the spread of the bacilli from the throat, and in a few cases we have traced intermediate middle-ear tuberculosis. In other cases the oldest seat of infection in meningitis is on the dorsal region of the spinal cord, and careful examination generally reveals tuberculosis in the bronchial or mediastinal glands; it seems most probable that the spinal cord has become infected from these glands by way of the lymphatics.

The Hygiene of the Nursery and the Prevention of Tuberculosis.

By HENRY ASHBY,

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While we must admit the possibility of an antenatal infection with tubercle, it is certain that tuberculous lesions are exceptional in the newly-born. It is rare for a mother suffering from tuberculosis to give birth to an infant exhibiting tuberculous lesions. Nor do infants often suffer from tuberculosis during the first few months of life. Tuberculous lesions are seldom seen in calves, even though the mothers suffer severely from tuberculosis.

On the other hand, tuberculosis in some form or other is a common disease in infants after the fourth or fifth month of life. It is perfectly clear that the infant after birth is constantly exposed to tuberculous infection, and suffers in consequence. In many instances this is due to direct infection from a parent or nurse or other member of the household who suffers from tuberculosis of the lungs, and discharges the specific bacilli in the secretions which are expectorated. During the winter months nurseries and bedrooms are badly ventilated, and the infant gets out but little into the open air, and thus all the conditions are favourable to the infection and cultivation of the organism in the system. I can call to mind a striking instance where the father was tuberculous and expectorated large quantities of mucus into his pocket-handkerchief, and was kept indoors during the winter; in the same house were two children aged respectively two years and six months, the elder with a tuberculosis of the lungs, and the younger with tuberculous glands and subcutaneous abscesses.

Less direct methods of infection are perhaps more common. The

dummy teat, so dear to infant and nurse, must take its share of responsibility as a germ-carrier. It may often be seen alternately in the infant's mouth and on the floor. Once the writer rebuked a mother for picking up the teat off a dirty floor and placing it direct into a crying baby's mouth. Presently the teat was again on the floor; this time the mother, mindful of the rebuke, wiped the teat on the infant's napkin, and replaced it at once into the infant's mouth! Some mothers and nurses have a habit of putting their fingers in the infant's mouth to suck while its food is cooling, or put the teat of the feeding-bottle into their own mouths to taste, and then direct into the infant's.

Doubtless the risk of infection of the infants by means of the milk of a tuberculous cow is a very real one, though I think it must take second place as a source of danger, the dangers from human beings who are carriers of the bacillus being greater than the danger from the cow.

There can be very little doubt that the dangers from infection during nursery years are very great, giving rise to tuberculous lesions of glands, skin, small bones, abdomen, lungs, and brain. Much preventative work remains to be done by impressing on all concerned the dangers of infection, and the importance of careful dieting, cleanliness in all things, and last, but not least, an abundant supply of fresh air in nurseries and sleeping-rooms.

Tuberculosis among Children, and the Milk Problem.

By GEORGE F. McCLEARY,

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The tuberculosis problem has been considerably affected by the publication of the second interim report of the Royal Commission. This document has come as a heavy blow to those who have denied the dangers of tuberculous milk. The Commission has not, indeed, conclusively proved as yet that human and bovine tuberculosis are one and the same disease, but the report leaves no doubt that tuberculosis in the cow is a fruitful source of disease and death in man. The following propositions have been demonstrated:

1. That "in a certain number of cases the tuberculosis occurring in the human subject, especially in children, is the direct result of the introduction into the human body of the bacillus of bovine tuberculosis."

2. That "a very considerable amount of disease and loss of life, especially among the young, must be attributed to the consumption of cow's milk containing tubercle bacilli."

3. That the milk coming from a tuberculous cow "ought not to form part of human food, and, indeed, ought not to be used as food at all."

The practical conclusion of the Commission is that their results "clearly point to the necessity of measures more stringent than those at present enforced being taken to prevent the sale or the consumption of such milk."

From the administrative point of view the question of bovine and human tuberculosis may be taken as settled. The necessary knowledge has been furnished; the danger has been demonstrated; and what is now required is increased preventive action. But here difficulties are encountered—to deal effectively with tuberculous milk increased powers are necessary, and the question at once arises, To what authorities shall these powers be entrusted? Clearly it will serve no purpose to give additional powers to the rural district councils, who neglect almost completely the powers they already possess. There can be no effective control of the milk supply without much rearrangement of administrative functions. The needs of modern life, as Mr. H. G. Wells has pointed out, call for considerable alterations in our local government areas; and the necessity for additional safeguards against tuberculous milk provides another reason for extending the administrative areas of our large towns.

Tuberculous Bone and Joint Disease in Children: its Effects on the Duration and Usefulness of Life.

By A. H. TUBBY,

M.S., F.R.C.S.,

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We are all too familiar with the many sad examples of crippling resulting from tuberculosis in infancy and childhood, and the aspect of these cases is the more sad, inasmuch as there are very strong reasons for believing that by early care and greater supervision, with a wider and more intelligent grasp of the problem, many of the very serious after-effects can be prevented. In the short space at my disposal, I propose to speak only of three of the most common forms of tuberculous bone and joint disease—namely, spinal caries, hip, and knee disease.

Spinal Caries.—This is the most serious of all forms of bone tuberculosis. It is extremely difficult to estimate the actual mortality, immediate and remote, but it may safely be said, without fear of contradiction, that at least 20 per cent. of all patients die, either during the progress of the disease or within a few years of its onset. Even if the patient survives the acute stages of the disease and attains adult age, the span of life is appreciably shortened. The average age of death in such cases is considerably under fifty years of age, and this contrasts very unfavourably with the expectation of life of healthy male adults. The disease is formidable enough in itself, apart from its most frequent complications, abscess and compression paraplegia. Deformity should not be regarded as an inevitable sequel of Potts' disease. If it is correct, as I have reason to believe to be the case, that not more than 5 per cent. of cases of spinal caries are diagnosed before deformity has set in, then what is required is a wider knowledge of the earlier symptoms and a more correct appreciation of the evil results of a hump-back. Among such are displacement of the heart and great vessels, and even in extreme cases kinking of the thoracic aorta. The lungs, too, are compressed and the blood insufficiently aerated. The result is gradual failure of the heart to carry on its work, and early death. If the formation of abscess complicates the case, as it is so likely to do in inefficiently treated patients, then the risk is immensely increased. It is found that 20 per cent. of cases of Potts' disease become complicated by abscesses, and these constitute either an immediate danger to the patient's life, or render him entirely incapable of becoming a useful member of the community for a considerable period, even extending to years. Paralysis appears in 13 per cent. of the cases, and even when cured after long periods of recumbency is liable to relapse. Such figures speak for themselves.

Hip Disease.—Until recently a large number of cases were treated by operation, but now the results which can be obtained by conservative methods are believed to be more satisfactory. It was thought that in hospital patients, operation done comparatively early in the disease would limit the length of treatment, but the final results have not been on the whole such as to afford very great encouragement. It is true that the disease may be eradicated by early excision, but it must be conceded that in very many cases the usefulness of the limb is very largely impaired. The direct mortality of hip disease is undoubtedly due largely to the immediate or remote effects of abscess. The statistics obtained by Bruns clearly show this. The mortality of the non-suppurative cases was 23 per cent., as compared with 52 per cent. in suppurative cases. Statistics vary very largely, whether they are collected from the hospitals or from the results of private practice. According to Whitman, the death-rate in America has been

estimated to be from 10 to 15 per cent., a much lower rate of mortality than that at the Alexandra Hospital, where a fatal issue followed in 26 per cent. of the cases. Whitman claims that the low rate in America is accounted for in part by the facts that the patients are of a better class, and they receive earlier and more efficient mechanical protection, and the latter is a vital consideration. We must now turn to the functional results which can be obtained from the treatment of the disease. There is no doubt that in a small proportion of cases the joint may recover entirely, and this is dependent upon the extent of the disease and the timeliness and efficiency of the treatment. The statistics obtained by Gibney, Waterman, and Reynolds of 107 cases in which mechanical and operative treatment was employed are very instructive. In more than half the number deformity was present when treatment was begun. No flexion was present at the end of the treatment in 47, but in 60 flexion followed of from ten to thirty degrees. Perfect movement was retained in 13, good in 22, limited in 41, and there was ankylosis in 31. In 69 cases the shortening was 1 inch or less, 35 having none. In 38 it was more than an inch. We therefore see that the disabling effects of hip-joint disease are very serious, but the lessons to be learned are that much crippling and danger can be saved to the patient if the case is recognized early and placed under skilled care, and has persistent treatment *from the beginning to the end of the illness.*

Tuberculous Knee-joint Disease. — Gibney of New York collected 300 cases. The mortality amounted to 40, or 13·3 per cent. Of those who survived, in 51 cases ankylosis was present, in 16 of these the limb was practically straight, and in 35 it was flexed more than thirty degrees. There is no doubt that when ankylosis of the knee exists in young life there is an increasing tendency towards deformity as the patient grows up. The results of operations upon the knee, such as arthrectomy and excision, are more satisfactory than in the case of the hip, but there is still much room for improvement.

It appears to me that the whole question of the incidence of tuberculosis in childhood needs to be grappled with on systematic lines. The first point is that it must be thorough from beginning to end. A case once taken in hand should never be lost sight of, and should not cease to be under constant supervision, until it is cured or beyond the reach of cure. In dealing with tuberculosis, "half-cures are no cures at all." Early recognition, thorough and complete treatment, extending, it may be, over years, and watchful after-care, are the key-notes of success. There is no doubt that the question must be dealt with from a common-sense point of view. A careful record should be kept of every case seen, and each case followed up through all its stages. This can only be done through the instrumentality of a central body having much influence and considerable funds.

Tuberculous Glands in the Neck.

By JOSEPH CUNNING,
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There are two prevailing ideas as to the method of infection. That lesions about the mouth play a part is beyond doubt; enlarged tonsils, adenoids, and carious teeth are the conditions which allow the entry of infection, and that direct infection by tubercle bacilli can occur in this way seems reasonable. On the other hand, it is taught by some that the glands are first inflamed by septic absorption from these areas, and that the tuberculous infection is secondary to this, and comes from an infected mesenteric gland or ulcer of the intestine through the thoracic duct or blood-stream. There is not space to discuss this fully, but it suffices to show that at the earliest sign of any chronic enlargement of the cervical glands, enlarged tonsils, adenoids, or carious teeth, if present, should be removed.

The usual course of a case is that the glands in the upper part of the anterior triangle are first affected, and from here infection spreads to the deep glands along the internal jugular vein, to the submaxillary group, and to the glands along the external jugular vein. At first there is a solid painless enlargement of the glands, but if allowed to progress the glands become matted to one another, to the deep structures, and to the overlying skin, and at this stage usually some softening can be made out. The abscess then points and discharges.

Treatment in the earliest stage consists in removing any focus from which further infection can enter, as mentioned above; then putting the child under the best possible hygienic circumstances at the seaside, with the neck kept at rest by some form of collar.

For cases taken early and with a sufficiently prolonged stay under these conditions there is a fair prospect of cure. But a very careful watch must be kept upon the glands during this time, for as soon as any increase in the size, any adhesion of the glands to one another or to the skin, or softening occurs, then is the moment for surgical interference.

Opening and scraping out abscesses I consider to be bad surgery, and only a waste of valuable time. If anything is to be done, the whole lymphatic area involved must be removed. This means that the internal jugular vein must be exposed, and all the fat, areolar tissue and glands in one mass dissected out. This is by no means so simple a matter as merely removing the obviously enlarged glands, but it ensures that the smaller infected glands will not be left to give

rise to trouble in the immediate future. There are two structures which have to be taken special care of in this operation—viz., the internal jugular vein and the spinal accessory nerve. The former can be removed if necessary; the latter ought not to be injured by anyone who knows its course, and that glands are commonly adherent to it.

Tuberculosis of the Skin in Children.

By JAMES H. SEQUEIRA,

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Cutaneous tuberculosis in childhood takes several forms. The most important, and by far the commonest, is *Lupus vulgaris*. In 92 per cent. of my cases the face and neck were attacked, and the disease, if advanced, produces so much disfigurement that the prospects of the sufferer obtaining work in after-life are seriously impaired. Apart from other considerations, it is, therefore, of importance upon economic grounds that the disease should be recognized early, for by treatment in its early stages the graver forms of disfigurement can usually be prevented. Inspection of children in elementary schools would be of great value, for *Lupus vulgaris* commonly begins in childhood. In 80 per cent. of the patients the onset is in the first and second decades of life, and in more than one-half (53 per cent.) the disease appears before the tenth year.

The question of prophylaxis is surrounded by difficulties, but certain points in the etiology show us the lines upon which to proceed. The tubercle bacillus reaches the skin in the following ways: (1) By direct inoculation through abrasions in the skin, scratches, etc.; (2) by direct inoculation of mucous membranes—for instance, of the nose and extension to the skin; (3) by the breaking-down of tuberculous glands, and infection of the skin from sinuses; (4) by spreading to the skin from sinuses leading to tuberculous foci in bone, etc.; (5) in rare instances, by the blood-stream from some internal tuberculous lesion.

Certain skins and some parts of the cutaneous surface and mucous membranes appear to be more susceptible than others, and it is a remarkable fact that females are more than twice as liable to lupus as males. Again, a low resisting power is necessary for its development, and this is particularly seen in the outbreaks which follow certain specific fevers. These in order of frequency are measles, scarlet fever, small-pox, typhoid, whooping-cough, influenza, and diphtheria. It is interesting to note that lupus is hardly ever met with in patients suffering from pulmonary tuberculosis.

In a large proportion of cases, I believe lupus to be due to direct inoculation. Finger-nails infected with the tubercle bacillus are, I think, the common cause. In 47 per cent. of my cases the lupus began as a small spot on the face or neck. In 28 per cent. the nose was the point of attack. In 8 per cent. the site of infection was on the body or limbs. In most of these there was undoubtedly local inoculation. It is exceedingly difficult to say in what proportion the outbreak occurred through infection by the blood-stream. A point of interest in this connexion is the fact that in more than 900 cases I have not seen the primary lesion on the back or the scalp. The skin in these regions is more resistant than elsewhere, and, moreover, is less liable to direct inoculation than other parts. In about 12 per cent. of my cases the disease was a sequel to the breaking-down of tuberculous lymphatic glands, and in 1·6 per cent. it spread from sinuses leading to tuberculous foci in bones.

As general prophylactic measures, good feeding, fresh air, and cleanliness in the home are of the greatest value. Special attention should be given in cases of convalescence from measles and the other specific fevers. Personal cleanliness is also of the utmost importance, and habits of scratching, picking the nose, etc., must be corrected. Improvement in the hygiene of the home will diminish the liability to local inoculation, and here the work of the home visitor will be most useful. The large proportion of cases which follow tuberculosis of glands and bone indicates the necessity of early and thorough treatment of these conditions.

Tuberculosis in Children and Lesions of the Upper Air-Passages.

By E. A. PETERS,

M.D., F.R.C.S.,

Surgeon in charge of Nose, Throat, and Ear Department at the Bolingbroke Hospital and Paddington Green Children's Hospital.

Walsham histologically examined thirty-four cases dying with pulmonary tubercle, and in twenty cases found tuberculous infection of the tonsils. The entry probably takes place into the conical projections of lymphoid tissue called after Stöhr. In nearly all cases of chronic tonsillitis the deep cervical gland over the tonsil is felt to be enlarged, and later the other cervical glands may become enlarged in lateral and central directions. It is agreed that tubercle entering tissue in bulk causes ulceration or else a tuberculoma, but the bacilli when in small quantities are either destroyed or are carried by the lymph-stream to be deposited either in the remote or proximal glands, or even in a distant part of the body by means of the blood-stream. Ulceration of the

tonsil and pharynx are of very rare occurrence, and are always secondary, while entry of bacilli into the substance of the tonsil is comparatively common. Clinically, it is found that enlarged glands are particularly liable to tuberculous disease when no tubercle can be discovered in the tonsils. Further, early treatment of adenoids and tonsils is most effective in preventing caseation of enlarged glands. In many cases glands are infected through the blood-stream with bacilli which have elsewhere entered, while chronic adenitis is a determinant of the point of incidence. Adenoids for the most part play only an indirect rôle in the infection, but in association with chronic tonsillitis in mouth-breathers require treatment. The rare tuberculoma of the septum is a primary focus. The tonsil is *par excellence* the portal of infection in this district, though probably the importance of the supra-tonsillar fossa has been exaggerated, and complete dissection of all tonsillar tissue is unnecessary.

Tuberculous Affection of the Larynx in Children.

By HAROLD BARWELL,

M.B., F.R.C.S.,

Surgeon for Diseases of the Throat, St. George's Hospital; Laryngologist, Mount Vernon Hospital for Consumption; Consulting Surgeon for Throat and Ear Diseases, Cripples' Home for Girls.

Tuberculous disease of the larynx usually occurs between the ages of twenty and forty; below that of twenty its frequency steadily diminishes, and in early childhood it is excessively rare, though a few cases have been recorded at between eleven and fifteen months of age.[1]

Pulmonary tuberculosis is most common between twenty and forty, but this alone does not explain the preponderance of the laryngeal complication, for the proportion of consumptives attacked by tuberculous disease of the larynx increases steadily up to the age of fifty and then declines.[2]

Tuberculous laryngitis is more often found post-mortem than clinically. Morell Mackenzie[3] found that among 500 cases examined clinically, only 1 patient was under fifteen years of age, whilst among 100 cases seen post-mortem, 1 case was under ten and 4 cases were under fifteen years. The larynx is rarely affected in childhood, and the reasons for this are not far to seek: (1) The progress of

[1] Heinze, *Die Kehlkopfschwindsucht*, Leipzig, 1879. Horne, Proceedings of the Laryngological Society of London, 1900. Rheindorff, *Jahrbuch für Kinderheilkunde*, 1891.

[2] "Laryngeal Phthisis," by R. Lake, F.R.C.S., and H. Barwell, F.R.C.S. Second edition. London: Baillière, Tindall and Cox. 1905.

[3] "Diseases of the Throat and Nose," vol. i. London: J. and A. Churchill. 1880.

pulmonary tuberculosis in children is a rapid one, and gives little time for the larynx to become infected; (2) the generalized form of tuberculosis is common, and, as miliary tuberculosis is hardly accompanied by sputum, infection of the larynx is improbable; and (3) such predisposing causes as previous laryngeal disease, chronic catarrh, etc., are absent. Moreover, the laryngeal involvement is apt to escape observation during life because laryngoscopy is difficult in young children, and the disease rarely appears until the little patient is very ill. Laryngeal symptoms also are usually absent in children. Dysphagia is hardly ever complained of; the only common sign is hoarseness, which may progress to complete aphonia. Any laryngeal affection in children is especially liable to be complicated by spasm and by œdema, and accordingly we find that rapid and urgent dyspnœa is not uncommon. I have now under my care a boy, aged eight, who has had a bad cough and hoarseness for ten weeks; he is now much wasted and almost completely aphonic; there are numerous enlarged glands in the neck, and both lungs show signs of miliary tuberculosis; the arytenoids are swollen and irregularly ulcerated, the epiglottis thickened and nodular, with superficial ulcera tion, and the edges of the cords are serrated; in addition, there is an extensive superficial ulcer on the posterior wall of the pharynx; but in spite of all this there is no dysphagia.

The prognosis in children is decidedly worse than in adults, and, according to Perrin,[1] death usually ensues in a few weeks. Usually the cases are too ill to attempt any but symptomatic treatment. Urgent dyspnœa calls for tracheotomy, which will prolong life, but in no way stays the course of the affection; intubation is absolutely contra-indicated. If dysphagia occurs, it should be treated with anodynes, of which orthoform is the most suitable.

Tuberculous disease of the larynx in children is characterized by its rarity, its tendency to occur only in the latest stage of tuberculosis, and consequently by the extreme gravity of the prognosis, and finally by the absence of dysphagia.

Tuberculous Cardio-vascular Affections in Children.

By THEODORE FISHER,

M.D., M.R.C.P.,

Assistant Physician, East London Hospital for Children, Shadwell.

Tuberculosis of the circulatory system rarely gives rise to disease that manifests itself during life. The pericardium is most frequently attacked. The inflammation which follows is usually of the plastic type, and in chronic cases leads to the formation of firm adhesions.

[1] Perrin, *Revue de Laryngologie*, 1902.

These sometimes produce a layer of considerable thickness, containing areas of caseous material. The heart, however, is rarely found to be enlarged, as is so commonly the case after rheumatic pericarditis, and very few examples have been recorded where there has been evidence that the adhesions have seriously hampered the action of the heart. Yet in some instances the cardiac muscle may be invaded by tuberculous material spreading inwards from the pericardium, and in other cases tuberculous masses of considerable size may be met with in the heart-wall which have arisen independently of pericarditis. More commonly, smaller tubercles may be scattered through the cardiac muscle. Another affection that has been described is tuberculous endocarditis, and tubercle bacilli are said to have been found in the vegetations. Endocarditis, however, when associated with tuberculous disease, generally occurs in chronic cases where secondary infections are present. The vegetations on the cardiac valves with little doubt are produced by septic micro-organisms, and tubercle bacilli when present appear there later. Not only the heart, but the *bloodvessels*, may suffer from invasion by the tubercle bacilli. It has been thought by some that tubercles in the walls of small bloodvessels in the lungs are a source of diffusion of tubercle bacilli through the body. Other observers state, however, that tuberculosis of the wall of a bloodvessel rapidly leads to thrombosis, which blocks the vessel if small, and covers over and excludes the tubercle from the circulation of the lumen if the vessel be wide. Tuberculosis of the bloodvessels, therefore, like tuberculosis of the heart, is of more interest pathologically than of importance from the clinical standpoint.

Tuberculous Involvement of the Nervous Structures of Children.

By W. B. WARRINGTON,

M.D., F.R.C.P.,

Physician to the David Lewis Northern Hospital, and Lecturer in the University of Liverpool.

Tuberculosis is found in the hard and soft membranes and in the substance itself of the brain and spinal cord of children. Congenital tuberculosis of the nervous system is, as elsewhere in the body, almost unknown. The lesions in the nervous tissues are rarely primary, but due to a secondary infection from some older focus. The most common primary site is the lungs. Children who crawl about the floor are in especial danger from the dust infected by phthisical parents. Abdominal tuberculosis is in 23 per cent. of cases the primary site of disease in children, and the recent investigations of the Royal Commission show that the tubercle bacillus obtained from the mesenteric

glands of children resembles in all its features the bacillus of bovine tuberculosis, and that the disease is, in fact, bovine tuberculosis, implanted in the human body, and conveyed by tuberculous cow's milk. The mediastinal, pre-tracheal, and bronchial glands are also often the original focus. Other primary sites are bones, especially the ear. So far, then, the etiology of tuberculous disease of the nervous system is clear. If the bones of the skull or spine are the primary seat of disease, the dura and pia mater may be infected directly.

From distant sites the bacillus travels to the brain and meninges by the blood-stream. Acute tuberculous leptomeningitis is the most common and, practically speaking, an invariably fatal infection. The maximum intensity of the inflammation is found around the course of the vessels of the Sylvian fissure, and these can often be seen to be the seat of definite tubercles. A fatal serous form of meningitis, not showing tubercle formation, but due to the toxins of the bacillus, also probably occurs. In the rarest of instances retrograde changes occur in miliary tubercle, and temporary or permanent cure may result. Occasionally larger masses—the so-called solitary tubercle—may be found situate in the dura or pia mater of the brain.

The well-known pachymeningitis externa caseosa is the commonest lesion in the spinal meninges, and is secondary to caries of the vertebræ, but tuberculous masses affect the membranes when there is no bone disease. In the cord itself large solitary tuberculous tumours sometimes occur, but these are far more frequent in the brain, especially in the cerebellum. The tumour starts from the walls of the vessels, and is often found connected with the pia mater growing into the brain substance. When free, it lies in a nest formed by soft tissue.

This growth gives the classical symptoms of tumour cerebri. It may undergo retrograde changes. Its characteristics of multiplicity, with softening and destruction of brain tissue, render operative interference of doubtful utility, but Sir Victor Horsley is in favour of operation in some cases.

Ocular Tuberculosis in Children.

By J. ACWORTH MENZIES,
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Hon. Ophthalmic Surgeon to Rochdale Infirmary.

The subject of ocular tuberculosis is at the present time in a somewhat chaotic state. Treacher Collins[1] has recently done good service by reviewing the whole subject and collating the more or less conflicting statements of various authorities. The facts upon which there is general agreement may be stated in the following propositions:

[1] "Intra-ocular Tuberculosis," *Ophthalmoscope*, vol. v., Nos. 1, 2, 3, pp. 2, 63, 116. 1907.

(1) Ocular tuberculosis is a comparatively rare condition; (2) it occurs more commonly in children than in adults; (3) it is doubtful whether tuberculous disease of the eye ever occurs as a primary condition. It is probably always secondary to a focus of disease elsewhere; (4) the structures most frequently affected in the eye are the iris and choroid, in which the capillary plexuses are finest; (5) tuberculosis of the conjunctiva, cornea, or iris occasionally occurs from direct inoculation of a cut or scratch with tuberculous material. It is obvious, therefore, that measures of prevention as regards ocular tuberculosis are those applicable to the disease generally. The only specific precaution is the guarding of an eye which has sustained a breach of surface from inoculation with sputum or other tuberculous material. On the other hand, cases are recorded in which marked improvement in general health has followed the excision of a tuberculous eye.

Further research is required to elucidate the relationship, if any, between the very common and very curable phlyctenular disease in children and the so-called tuberculous diathesis.

Tuberculosis and Public Schools.

By CLEMENT DUKES,
M.D., B.S., F.R.C.P.,
Physician to Rugby School; author of "Health at School."

The occurrence of tuberculosis amongst the boys in public schools and the girls in high schools is, or should be, conspicuous by its absence, except it be in the form of chronic tuberculous glands. But in order to insure this it behoves those who have at heart the welfare of these adolescents to strive to remove the conditions which engender tuberculosis, otherwise the seeds are sown, or the type of constitution fostered—that is to say, the fitting soil developed—for the growth of tubercle bacilli during school-life or after its termination. I do not mean those sanitary conditions which should be above suspicion in boarding-schools, such as perfect drainage of school premises and land, a pure water-supply, and milk, unboiled and yet above suspicion, for this can be attained in schools situated in the country, as boarding-schools should always be, where endeavour is made to secure it.

It would be well for teachers to understand, and to teach adolescents, that tuberculosis is a *house disease* even more than an infectious disease, and that its extermination can be effected by fresh air in the school buildings and by cleanly habits. By many means we *may* alleviate the range of intensity of tuberculosis in the present generation; but it is mainly through the education of the young that we *must* seek its prevention.

There is a movement abroad for the teaching of hygiene in schools. But it must not be thought that the teacher is going to inculcate the principles of hygiene upon his pupils when he does not see that they are put in practice in his daily life at school.

For the child to reap the advantage of the teachings of sanitary science, requires to experience their cogency in his daily life. What is the sense of teaching the necessity of fresh air in the maintenance of health and in the prevention of disease when the child is compelled to spend five hours a day in the unsavoury atmosphere of an ill-ventilated, overcrowded schoolroom, or in a still worse cubicle or dormitory, and where dust and dirt are harboured?

What is the use of teaching a class the virtues of personal cleanliness when the pupil is allowed to come to school with unwashed face and hands, and finger-nails loaded with dirt, unkempt and uncut hair, uncleaned teeth, unbrushed clothes, and boots never once properly cleaned during the term? What is the purport, except derision, of expounding in class the importance of proportional brain-work and brain-rest in the physiological growth of the brain, when the hours of school-work are too prolonged and the hours of sleep too curtailed? What is the drift of instilling the need of daily exercise and recreation in the formation of character, in the development of the body, and for the proper performance of its functions, when work is so arranged that no time is allotted for the purpose, or the games are so ill-organized that it is no one's business to see that every boy and girl has an opportunity of playing; or, still worse, where a school is constructed without even a place for play?

What is the rationality in teaching tidiness, neatness, thoroughness, and punctuality when they are allowed to go by default?

Such details must be thought out and put in force before the principles of hygiene can attain their due weight and create such a state of health that tubercle bacilli have no power to devastate children at school, or induce such ill-health that they generate in after-school life.

Tuberculosis among Children in the Elementary Schools of London.

By J. EDWARD SQUIRE,

C.B., M.D.,

Senior Physician, Mount Vernon Hospital for Consumption and Diseases of the Lungs, Hampstead and Northwood.

The very great amount of tuberculosis amongst children of school age is well known; the prevalence of the disease amongst children actually attending school is a different matter. Children who by reason of illness are physically unfit to attend school are necessarily

excluded, and all those who, though well enough to attend school without harm to themselves, might by reason of their condition be a source of danger to others, are by regulation of the medical officer kept from school. Under this regulation all cases of "open" tuberculosis are excluded, such as cases of pulmonary tuberculosis with expectoration, and surgical tuberculosis with discharging wounds. It is not, therefore, to be expected that there will be a very large number of cases of active tuberculosis amongst children attending ordinary public schools. There are special invalid schools to which are sent many of the children crippled by tuberculosis of spine or hip, or with "weak chests" which prevent regular attendance during the cold and wet months. This still further reduces the number of cases of tuberculosis attending the ordinary elementary schools. Nevertheless, seeing how prevalent tuberculosis is amongst the class by whom these schools are chiefly used, there appeared to be some risk that cases of unsuspected or undetected tuberculosis might be found amongst the school children in sufficient numbers to be a source of danger.

An inquiry has, therefore, been instituted to ascertain the amount of tuberculosis amongst the scholars of the elementary schools under the education authority of the London County Council. Though this inquiry is not yet completed, there is already sufficient evidence to show that the number of actively tuberculous children attending school is very small, and the number of cases of "open" tuberculosis attending is infinitesimal.

It is, of course, to be understood that there are many conditions common amongst children, and which may possibly be caused by tuberculous infection, which are not classed as tuberculosis for the purposes of this inquiry, though they are carefully noted in all cases. If all enlarged glands, swollen tonsils, and adenoids were classed as tuberculous, and all cases of cough, all crepitations in the lungs, all bronchitic râles were included as tuberculosis, and if, further, we gave rein to conjecture, and admitted a strumous diathesis or a "pre-tuberculous" condition, the returns would include a large proportion of the children attending the schools in the poorer neighbourhoods—and, incidentally, would be valueless.

A careful examination of about 900 children in one school in a very poor neighbourhood gave the proportion of cases of possible tuberculosis of the lungs at about 1·5 per cent., and of other forms of tuberculosis at less than 2 per cent. The cases of *probable* tuberculosis of the lung amount to 0·5 per cent. These cases of pulmonary tuberculosis had no cough, and were unsuspected until discovered by examination of the chest. The cases of tuberculosis in other parts were nearly all inactive—scars of abscesses in the neck, cured hip disease, or large heads from hydrocephalus.

It must be borne in mind that the above figures refer to a school specially selected for the poverty of the neighbourhood, where the conditions favour the spread and development of tuberculosis.

Pulmonary Tuberculosis in Lancashire School Children.

By ALFRED GREENWOOD,
M.D., D.P.H.,
Medical Officer of Health, and Medical Officer to Education Committee, Blackburn.

It is well known that the diagnosis of pulmonary tuberculosis in children is more difficult than in adults. The physical signs are often slight, and it is not possible to obtain a personal history, or a specimen of the sputum, as easily as in the adult. Moreover, the apex of a child's lung is not affected as often as is that of the adult. There are, however, many conditions which render a child's lungs favourable for the reception and development of the tubercle bacillus. Such conditions include: (1) The length of time spent daily in a schoolroom which is often very dusty; (2) changes of temperature involved in passing from a hot, badly-ventilated schoolroom into the cold air of the street; (3) the frequent extensive epidemics of measles and whooping-cough with their pulmonary sequelæ; (4) sleeping in a badly-ventilated bedroom.

The extent to which consumption occurs amongst school children has recently evoked a considerable difference of opinion amongst certain members of the medical profession.

Ashby and Wright examined 155 cases of tuberculosis dying in the Manchester Children's Hospital, and found post-mortem that in 141, or 91 per cent., the lungs were affected. They made a careful examination of these cases in order to form a conclusion as to the route by which the infection had entered the system, and came to the conclusion that in at least 50 per cent. the bronchial glands or lungs were first affected.

Any mortality statistics are by no means an indication of the number of children who may have tuberculosis of one or more organs and who recover. Cases vary so much. During the year 1906, 709 children were brought to Dr. Wilkinson, Medical Officer to the Oldham Education Committee, for medical examination. Of this number, 54 were suffering from tuberculous disease, and 17 of these 54 cases were suffering from involvement of the lungs. Thus, amongst the 709 children referred by the school attendance officers to Dr. Wilkinson he found 2·3 per cent. of phthisis.

Statistics regarding the extent of phthisis amongst Lancashire school children are very incomplete. The following are the results of my examinations amongst 1,028 Blackburn school children:

Date.	Phthisis.	Other Forms of Tuberculosis.	Total.	Number Examined.
Oct., 1903, to Dec., 1904, inclusive	34	20	54	338
Jan., 1905, to Dec., 1905, inclusive	17	6	23	338
Jan., 1906, to Dec., 1906, inclusive	18	26	44	352
Totals	69	52	121	1028

Five of these cases of phthisis have been examined twice since 1903, which reduces the number of cases of this form of tuberculosis to 64 out of 1,028 children. It should, however, be stated that these 1,028 children were not taken at random from the schools, but that they were selected specially by the school attendance officers, in order that they might be medically examined as to their fitness or otherwise for school. The percentage of cases of phthisis calculated upon these 1,028 children —namely, 6·2 per cent.—is therefore not to be taken as representative of Blackburn school children considered as a whole. A complete medical inspection of 400 children in attendance at two Blackburn schools has recently been carried out, and only one case of phthisis was discovered. The amount of phthisis is manifestly greater amongst children specially selected for medical examination, on account of absence from school through illness, than amongst a similar number of children in attendance at school taken at random. It should also be stated that during 1904 the school attendance officers referred to me many children who were obviously unfit to attend school. The majority of the children *now* sent by these officers are those regarding whom there is more doubt as to their fitness for school. The institution of a complete medical examination of all school children would render any conclusions more definite regarding the extent of phthisis amongst this important section of the population. It is to be hoped that in the near future Parliament will make such a systematic medical inspection of school children compulsory. Whatever doubt may be cast upon my figures, I am still firmly convinced that phthisis occurs amongst children much more frequently than is commonly supposed.

Tuberculosis among School Children in Scotland.

By WILLIAM ROBERTSON,
M.D., D.P.H.,
Medical Officer of Health, Leith, N.B.

When the broad principle of medical inspection of school children is mooted, the suggestion is greeted by instant approval. But few school authorities will move in the matter of medical inspection until statutory stimulation is applied to them. Parliament has already provided English school authorities with the necessary incentive. In Scotland we are anxiously looking forward to an Education Act that will goad our authorities into action. The case for medical inspection has been convincingly proved by various voluntary efforts in Glasgow, Edinburgh, Dundee, and Leith. The question is of such far-reaching and obvious importance that the delay in putting it into universal operation is, to say the least of it, surprising.

Aided by several ladies and gentlemen, all experienced practitioners, I instituted an inspection of school children in Leith last summer. The school chosen was one attended by children drawn from the humbler ranks of society. In all 806 scholars were examined as to their physical condition. The examination was critical in the extreme. Boys and girls were stripped bare to the waist, and doubtful results were carefully reviewed. It is only possible, in the small space at my disposal, to summarize concisely the interesting results secured. My purpose will be achieved if for the present I point out that of the 806 children examined, 6 were found to be suffering from tuberculosis of the lungs. The discovery of these children testifies more eloquently than any contribution in writing is able to do in favour of careful physical examination of school children.

The presence of these boys and girls in a crowded class-room suggests a wide sphere of administrative action. We should have, for instance, notification of the cases on the part of the medical inspector. Not, be it observed, that form of notification originally suggested by the Local Government of Scotland, but notification minus several unworkable restrictions, school attendance being one of them.

Each of these infected scholars had doubtless been spraying tubercle bacilli about clothing, desks, slates, and floors. Drawn, as many were, from insalubrious houses, many of the children sitting beside those suffering from tuberculosis must have provided suitable subjects for attack. Susceptibility was there. It was encouraged by home environment, lack of nourishment, and bad family histories. All these

points were brought into bold relief by the examination made in detail. I think I have said enough to prove that when medical inspection becomes an accomplished fact the Medical Officer of Health will welcome it as a valuable accessory in perfecting his organization for the administrative control of tuberculosis of the lungs. The early discovery of cases among school children would be the precursor of missionary effort on the part of the Medical Officer of Health. The value of keeping in touch with early cases cannot be overestimated. Moreover, the suitability for treatment impresses one with its urgent necessity.

The Dietary of the Tuberculous Child.

By ROBERT HUTCHISON,

M.D., F.R.C.P.,

Assistant Physician to the London Hospital and the Hospital for Sick Children, Great Ormond Street; Author of "Food and Dietetics."

It has been remarked, I think by the late Professor Hughes Bennett, that the chief causes of tuberculosis in childhood are "the frequency of pastrycooks and the dearness of butter," which meant, I take it, that children are apt to spoil their appetites by eating between meals and by consuming sweet, unwholesome things, and that their diet often does not contain enough fat. The dictum—like most of its class—must be taken with a grain of salt, but at all events it brings into prominence two most important points in the feeding of tuberculous children—viz., the necessity (1) of exciting and maintaining appetite, and (2) of seeing that fatty foods are supplied in abundance. Complete want of appetite is a stumbling-block which one is apt to encounter at the very outset of one's efforts to improve the nutrition of a child who is the subject of tuberculosis. It may sometimes be removed by the administration of a simple alkaline and bitter mixture before meals, but by far the best way of overcoming it is by change of air, especially to the seaside. At the same time any disorder of the alimentary canal which may interfere with the proper digestion and absorption of food must be corrected, diarrhœa being, perhaps, that which is most often met with. It is only when appetite has been excited and any such disorder removed that the way is clear for improving the patient's nutrition by diet. That fatty foods are of the greatest value in chronic tuberculosis all clinical observers are agreed, although it is not really known wherein their peculiar virtue consists. Here again one is sometimes met by a great repugnance of the child to all forms of fat. A congenital distaste for fat may, indeed, be really a predisposing cause of tuberculosis, and in the case of a child who inherits tuberculous tendencies every effort should be made to overcome it. This can usually be done if the process

of education in fat-eating be begun gradually, and if the fats be given at first in a finely divided form and well mixed up with other foods. In this way a "digestive habit" in favour of fat may be slowly built up.

Of the various forms of fat available, those with a rather low melting-point are most suited to promote nutrition in tuberculosis—such, for example, as cream, butter, bacon fat, and the vegetable oils. Cod-liver oil probably owes its undoubted utility to this property, and should really be regarded as a food taken than a drug. Fortunately few children dislike good butter, cream, and bacon fat, as these should always enter largely into the diet in cases of chronic tuberculosis.

It must not be supposed, however, that fat is the only important ingredient of the diet. All the more recent students of the dietetic treatment of tuberculosis, and especially of phthisis, lay stress—and rightly—upon the necessity of avoiding a lopsided diet in which the fat-forming constituents are contained in excess, and of taking care that the tissue-forming or nitrogenous constituents are abundantly represented as well. This is all the more necessary in the case of children in whom, owing to the need for providing for growth, the demand for nitrogenous material is already high. In practice this means that the diet must contain a fair proportion of meat. Milk, too, is a source both of fat and of nitrogenous material, which has the additional advantage of being easily digested, and it should be freely given. Unless the source of the milk be above suspicion, it is safer that it should be boiled in order to avoid the risk of further infection by tuberculosis, of which milk has now been proved to be a possible source. Farinaceous foods must, of course, enter into the diet, plain milk-puddings being one of the best forms in which to give them, but care should be taken that they do not displace the fatty and nitrogenous articles; there is no fear of their being too much neglected.

It only remains to add that the simpler and plainer the diet the better, and that all rich, highly-seasoned, or oversweet articles should be strictly forbidden.

Exercise in the Prevention and Treatment of Tuberculosis in Children.

By HARRY CAMPBELL,

M.D., F.R.C.P.,

Physician North-West London Hospital; Author of "Respiratory Exercises in the Treatment of Disease."

As with all other organs, so with the lungs, a due amount of exercise is needful for their normal development. Now, the better developed the lungs, the more are they able to resist disease, tuberculous or other; consequently, if we wish to increase their resistance to

tuberculosis, we should take steps to ensure their proper development. Inasmuch as the function of these organs is to expand and contract, it follows that whatever excites the respiratory movements favours their development. The simplest means of exciting the respiratory movements is by exercises which cause breathlessness. If we watch the chest during profound breathlessness, we shall find that, while inspirations are deep, expirations are comparatively incomplete, so that the mean size of the thorax is increased, the enlargement being in proportion to the degree of breathlessness. Hence the thorax is larger during the act of walking than in repose, and larger when a person is running than when he walks. One of the objects of this augmented pulmonary capacity is doubtless to open up the pulmonary circuit, and thus facilitate the work of the right heart, which during vigorous muscular exercise has to drive an extra quantity of blood through the lungs.

Now, inasmuch as exercises which cause breathlessness expand the chest, it follows that we have in them a ready means of permanently augmenting thoracic capacity, for the effect of the predominating action of the inspiratory muscles is to cause a permanent shortening of them, and as a result of this the chest becomes fixed in a more expanded position. Hence the best way to bring about a permanent enlargement of the thorax, and thus to ensure adequate pulmonary development in the child, is to prescribe exercises which induce breathlessness, such as running, jumping, skipping, and dancing, rather than gymnastics, dumb-bell, and kindred exercises, which cause comparatively little breathlessness, and increase the girth of the thorax mainly by developing the muscles enveloping it.

Tuberculin in the Treatment of Tuberculosis in Childhood.

By CLIVE RIVIERE,

M.D., M.R.C.P.,

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The position of tuberculin as a therapeutic agent being now assured, it behoves us to apply it where it is most suitable, and our thoughts promptly turn to the vast field of localized tuberculosis in children. Here is its most appropriate sphere, and here, at present, it has received but scanty attention. Some general references to its use may be found in articles by surgeons on the treatment of surgical tuberculosis in children, but its use has been mainly empirical, and the doses,

unchecked by opsonic determination, have generally been heroic in strength.

Dosage.—The ideal dose is the smallest quantity that proves efficient. When I began to study tuberculin treatment in children I could get but scanty advice as to dosage; my first cases received $\frac{1}{2000}$ milligram irrespective of age, but I soon learnt that such doses were dangerous for young children, and unnecessarily large for older children. I now consider $\frac{1}{12000}$ to $\frac{1}{8000}$ milligram suitable for a child of one year, $\frac{1}{4000}$ milligram for a child of five years, and $\frac{1}{3000}$ milligram for a child of ten to twelve years; $\frac{1}{2000}$ milligram is my usual adult dose. It is well to begin with a small dose, and to watch the effect on the opsonic index during the whole phase of altered bacteriotropic power. Afterwards, if the reaction is sufficient and the negative phase not too long, the same dose may be given every two weeks, the opsonic power being watched to determine that the negative and positive phase maintain a suitable proportion.

Opsonic Index.—Tuberculin cannot be safely given to children without determination of the opsonic index. At present the method is somewhat laborious, but much time and trouble may be saved by arranging to examine some eight to ten specimens of blood at a single sitting. A hundred leucocytes must generally be counted to attain a fair degree of accuracy, and where the phagocytic index (the average number of bacilli per leucocyte) is low, a still larger count is desirable.

My own experience of tuberculin treatment in children may be shortly stated as follows: (1) Tuberculin given in suitable doses is an almost certain remedy for localized tuberculosis. The improvement is threefold: a gain in weight and general condition, a marked mental change exhibited in a more cheerful and optimistic outlook, and a tendency to local healing. Often the local condition improves, even to healing, after the first injection, but there is generally relapse, and several inoculations are necessary to complete the cure. Among such localized cases tuberculous dactylitis, superficial abscess, tuberculous glands, and tuberculous joint diseases have come under my own care for treatment. (2) Less localized tuberculosis, such as tubercular peritonitis with fever, may improve on tuberculin, even though the opsonic index before treatment was high and fluctuating. Nearly all my cases of tubercular peritonitis improved rapidly; one case had been going downhill persistently for many months on ordinary hospital treatment, but immediately improved when tuberculin was used. Under the same heading may be placed cases of phthisis with constitutional disturbance. (3) In tuberculosis complicated by secondary infections, the downhill course may be arrested and the case cured by tuberculin. All open tubercular lesions become in time the home of other organisms,

mainly staphylococci and streptococci, and in some instances the secondary infection has considerable influence on the course of the disease. It is remarkable that if the tubercular lesion is treated successfully with tuberculin, the organism soon acquires the power of throwing off the secondary infection. (4) Tuberculin cannot take the place of surgical procedures, but should be used in conjunction with these. Nevertheless, the earlier it can be used, the less need will there be for surgery.

NOTE.—Since writing the above there has appeared in the *Scottish Medical and Surgical Journal* for May an interesting article on tuberculin treatment in children by Dr. J. M'Intosh. This is the only series of cases I have seen, in addition to my own, where this treatment in children has been conducted on scientific lines. Dr. M'Intosh's results have been very uneven and, on the whole, unsatisfactory; may I suggest that this is attributable to the large dose ($\frac{1}{1000}$ to $\frac{1}{500}$ milligram) administered, the cases which improved being those having sufficient resistance to this dose either on account of higher age or idiosyncrasy. The results of treatment with tuberculin by different observers cannot be justly compared until some agreement as to dosage is reached.

Anti-Tuberculosis Methods for the Protection of the Children of the Poor.

BY JOHN F. J. SYKES,

M.D., D.P.H.,

Medical Officer of Health for the Metropolitan Borough of St. Pancras.

In protecting the children of the poor against tuberculosis, the essential points to bear in mind are that the child may be mainly infected (*a*) through the alimentary system by means of milk and meat, and (*b*) through the respiratory system by means of relatives or companions; and that, in regard to the former (i.), systematic bacteriological examinations of milk and meat are required; and in regard to the latter (ii.), means of isolating persons suffering from pulmonary tuberculosis either in special institutions or separate bedrooms are required. These are the most urgent points at issue; but Miss M. E. Bibby, B.A. Lond., our inspector, furnishes some details that may be of interest in practice, based as they are on observations she has made in visiting and inquiring into tuberculous cases:

"The following steps seem likely to be of advantage in the protection of the children of the poor from this disease:

"1. The removal of any tuberculous patient from the neighbourhood of the children, or, where removal is not possible, the provision of

a separate sleeping-room, and extreme care as to precautions against infection. The visiting of cases of which information is received with a view to secure attention to these points.

"2. Emphasizing during such visits the special importance with regard to children of the careful observance of the usual precautions against infection.

"3. Ascertaining whether any children of a family possessing a consumptive patient show any special tendency to such diseases; where this is the case, advising care in feeding and clothing and the obtaining of a fresh-air holiday, where necessary, with the help of the Invalid Children's Aid Association or the Children's Country Holiday Fund.

"4. The provision of playgrounds for children, with shelters for use in wet weather reasonably near the poorer houses; roof playgrounds on blocks of working-class flats where land is too expensive for ordinary garden play places.

"5. Special attention by school nurses and medical inspectors to children who in school appear in danger of suffering from tuberculous disease, with a view to the reference of such cases to managers or other visitors who would see and advise parents as to preventive measures.

"6. Simple instruction in the schools, given in the course of ordinary hygiene or domestic economy lessons, on fresh-air feeding and precautions against infection. This is not directly and immediately effective for the children, since they do not control their own environment, but the children form a valuable channel for the passage of information to the parents.

"7. The more thorough cleansing and ventilation of elementary schools with a view to their greater healthiness, and to their value as examples of cleanly surroundings."

These observations I can endorse as embracing useful practical details worthy of the consideration of those formulating a complete scheme of prevention.

Tuberculous Infection of Children in Public-houses.

By SIDNEY DAVIES,
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Many hygienists, and notably the late Professor Brouardel of Paris, have emphasized the connexion between alcoholism and tuberculosis. Every medical man of experience knows how the consumptive poor seek comfort and solace in the light and warmth of the

public-house. Dr. James Niven, of Manchester, was among the first to call attention to the public-house as a definite source of tuberculous infection. Dr. Arthur Ransome has also written on the subject. In a paper on "The Source of Infection in Tuberculosis," contributed to the Society of Medical Officers of Health, and printed in *Public Health* (vol. 1903-1904), I described how tubercle bacilli had been found in the floor-sweepings of two public-houses out of six examined in my district. From inquiries into deaths from and notified cases of phthisis, and from the Registrar-General's returns as to the phthisis death-rate of public-house servants, I arrived at the conclusion that the public-house, after the home, is probably the most important source of infection in this disease. Further investigations have confirmed this opinion. Men, of course, are the principal victims in this way, though many cases have been met with in which women, too, were probably infected at the drinking tavern. Certainly few persons have suspected that the tuberculosis met with in children was commonly contracted in such places. We do well to remember the statement of Dr. Parkes Weber, that the children of alcoholics "are often born with deficient resisting power, and thus fall an easy prey to tuberculosis." My own researches in the borough of Woolwich go to show that the home is the most common source of infection for children under ten, accounting for probably about half the cases. Tuberculous milk probably is the source in, say, about 10 per cent. of the cases. What is the source for the remaining 40 per cent.? Only in three cases during the last three years has a drinking-bar been definitely suspected to have caused tuberculous infection in children. But undoubtedly we have, as medical men and sanitarians, failed to realize the extent to which young children are habitually taken into public-houses and dosed with alcohol. Mr. G. R. Sims has done much to open the eyes of many in regard to this important subject.

In order to ascertain to what extent children are taken into public-houses in Woolwich, a reliable observer watched certain houses in a poor part on Saturday and Monday evenings during a total period of two and a quarter hours, between 7.30 and 10.30 p.m. Altogether thirty-eight women with young children—chiefly babies—were seen to enter a public-house. As there are 186 public-houses in the borough, it is obvious that a considerable number of children are exposed to the risks of tuberculous infection. Information obtained from policemen and others shows that it is not only in the poorest districts that children visit the drinking saloons. Respectably dressed women are often seen to enter public-houses with babies in their arms. The air of these places, laden with tuberculous germs from the spitting and coughing of phthisical customers, the dust from the floor mingled with tuberculous sputa, form a tuberculous environment which few children

habitually exposed to it could be expected to successfully resist. If, in addition, their resistance is weakened by general malnutrition, neglect, and the administration of sips of beer and spirits, which are known to be frequently given, little wonder that many become a quick and early prey to tuberculosis.

The infant of a young mother fed at our milk-depot was found not to be gaining in weight, and to have symptoms suspicious of early tuberculosis. Inquiries elicited the fact that this child was taken at night to the public-house. The mother, warned as to the danger, gave up the practice, and the child began to improve.

It is well that attention has been focussed on a source of tuberculous infection of children probably only second in importance to that of home infection. The simplest remedy seems to be to make it illegal for children under the age of fourteen to be taken into a public-house. Alcoholic drinks and public-houses are prejudicial to children. It is far easier to keep the children out of the public-house than to keep such places free from infection.

Tuberculosis among Children in Egypt.

By Mrs. B. SHELDON ELGOOD,

M.B.,

Medical Officer, Ministry of Public Instruction, Egypt.

Tuberculosis occurs extensively among European and native children in both Upper and Lower Egypt. The number of victims is augmented by Soudanese children temporarily resident in Egypt. The Soudanese in the Soudan show very little resistance to tuberculosis, and the colder, damper climate of Egypt increases their susceptibility. Out of 4,743 children of all nationalities, under the age of two, treated by myself at a Cairo dispensary, 76 suffered from pulmonary tuberculosis and 2 from meningitis (a percentage of 1·6 per cent.). It is not possible to say whether tuberculosis is more frequent now than in the beginning of the last century, since many cases now diagnosed as tuberculosis were then classed as chronic broncho-pneumonia, scrofula, etc. The statistics of the last twenty years show an increase of the disease in the towns. They cannot be relied on, however, since during the same period the diagnosis and registration of causes of death has been performed with increasing accuracy, and the population has but recently begun to make use of the newly established Government hospitals.

The disease in infants is as insidious and as fatal as in Europe. Daily afternoon fever is a more marked symptom at an early stage, and

may suggest malaria; but the absence of rigors, the inefficacy of quinine, and the tendency to severe and often fatal broncho-pneumonia, clear up the diagnosis. Generalized tuberculosis of the glands I have found rarer in Cairo than in Alexandria, where it is very common in children over two years of age. In my experience, the most careful removal of these glands, unless done in hospital, usually resulted in the generalization of the disease, with a fatal termination through pulmonary infection. I now recommend (with some success) plenty of milk, tonics, and removal to a drier climate, such as Minieh or Luxor. The tuberculin treatment is not in general use in the country. There is no special sanatorium for children suffering from tuberculosis.

ORIGINAL PAPERS.

TUBERCULOSIS IN WOMEN AND CHILDREN.

By MARY SCHARLIEB,

M.S., M.D.,

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THERE is no doubt of the tremendous importance to the nation, as well as to the individual, of a clear knowledge and right understanding of the causes, manifestations, and treatment of tuberculosis in all its protean forms. It has been well pointed out that, although tuberculosis is exceedingly common and fatal in little children, yet its main incidence and most deplorable effects are to be found in young adults, men and women in the very prime of life, during the years when they are most actively engaged in the duties of reproduction.

General Principles of Anti-Tuberculosis Work.

It has been ascertained that tuberculosis, like malaria and many other diseases, is in great measure preventable, and ought to be prevented, and there is no doubt that the chief obstacle to the entire prevention of this fatal disease is the ignorance and apathy of the people themselves, and of those who ought to be their guardians and their natural leaders. Medical officers of health, both in urban and in rural districts, constantly complain that their best efforts to prevent disease and to secure the welfare of the people under their care are rendered nugatory by the prejudices and ignorance of the urban or rural district council. The density of ignorance that prevails amongst us on these matters is simply astounding, and it seems a task almost too great to attempt to dispel this ignorance. However, each of us interested in the subject must do what little is possible to draw the attention both of the educated and also of the uneducated to the disgraceful amount of preventable disease which is present in our midst.

During the prevalence of plague in India most of us have felt a thrill of righteous indignation against what we consider the stupidity and ignorance displayed by the panic-stricken natives. In our self-righteousness we feel that they are ungrateful and foolish in not welcoming house-to-house visitation, the cleansing of their plague-stricken abodes, and the deportation of their sick friends to the plague camp or hospital. Have we, however, as a nation any right to blame

or to judge our fellow-subjects? They have an excuse which we have not, for the means necessary to the stamping out of plague in India are frequently in direct contravention, not only of their national and social feelings, but also of their religious convictions. We cannot pretend that a following of the laws of hygiene, and the cultivation of personal health, of domestic cleanliness, and of true urban conservancy, militate in any sort of way against our professed religion. As to our prejudices, we are loud in proclaiming that they are all in favour of cleanliness. We may perhaps be permitted to hope that when we ourselves understand a little more of the matter, and when we are able to interpret the laws of health better to people who have not shared in our scientific education, we may meet with a more considerable share of success, and that the advent of that happy day is already foreshadowed by the great fall in the mortality from tuberculosis, which amounts to more than 50 per cent. during the last thirty years.

The Prevention of Tuberculosis in the Pregnant Woman and her Offspring.

Probably under this heading should be first considered the question of whether individuals in any way infected with tubercle should marry. It is, of course, impossible to legislate on this subject, but in process of time a well-informed public opinion would lead to a great diminution of undesirable marriages. Even now many individuals deny themselves in this respect, fearing to bring into the world children too heavily handicapped for the race of life. Marriages between near relations, such as first cousins, are greatly to be deprecated, the children of such unions being frequently fragile, undersized, and predisposed, not only to tuberculosis, but to many other diseases.

The question of heredity as a cause of tuberculosis has been hotly debated, and while many authorities hold that tuberculous mothers are bound to produce tuberculous children, an equally imposing array of great names is to be found on the other side. It appears to be probable that, inasmuch as very few children are born with tubercle, and that as few develop it within the first year of life, it is not likely that tubercle is directly transmitted. It is far otherwise, however, with that frailty of tissue and absence of vitality which are amongst the chief predisposing causes of tubercle. Although this disease is comparatively rare in children under one year of age, a very large proportion die between one year and the completion of the sixth year. Then follows a period of comparative immunity, and it is not until the age of adolescence that the mortality from tuberculosis again becomes formidable; but from that time on to about the completion of the third decade there is a constant sacrifice of the most useful lives in the community. These facts may perhaps be explained somewhat in the following way: The

little infant is evidently not born with tubercle, and during the first few months of life his circumstances are not such as to lead to its development. From the time, however, that the child is able to crawl, and therefore to inhale and to eat dirt laden with germs of tubercle, from the time that he is fed on contaminated milk, and still more from the time (these agencies still continuing) he is, in addition, subjected to the dangers of the schoolroom, the mortality increases apace. Thus there is probably a weeding out of the children least fitted to survive, and from about the time of the second dentition up to puberty the child's natural love of exercise and open-air life affords some protection from the invasion of tubercle. At the time of puberty a great strain is thrown on the system, and, in addition to this, attendance at school or the commencing struggle of life tends to lower vitality and to prepare the way for disease. A little later on many other evil influences, such as those of alcoholism and other forms of immorality, combine to diminish the resisting power, as shown by the greatly increased death-rate from phthisis and kindred diseases.

It has been very justly said that pregnancy is the great test of the soundness of a woman's constitution; that at this time the balance between a physiological and a pathological condition is so delicate that it needs but little for pregnancy to cease to be a condition of health and to become one of disease. Pregnancy is physically the most important period of a woman's life, for she is engaged in the great work of forming and developing a human being, one who will owe to her in the greatest measure its happiness, health, and well-being throughout its life. She is also greatly responsible for the condition of health that is to be hers during those all-important years in which she is bringing up and influencing for good or for evil the children whom she has brought into the world. It would be a good thing for the nation if the mothers of the land could be made to understand the tremendous importance that attaches to their health and well-being, and if they could be brought to realize how very greatly the matter lies in their own hands, and to how comparatively small an extent it is dependent on their circumstances. The laws of hygiene apply equally to the palace and the cottage, and their carrying out always depends greatly on the way in which a woman understands and is prepared to be obedient to them. It is quite true that it does not lie in all women's power to command adequate cubic space, adequate light, warmth, and food; but she is not so powerless even in these respects as she sometimes considers herself. The thrifty, hardworking, and habitually clean woman can do much in even the most unpromising surroundings. There is no doubt that the woman who means to keep her home clean and tidy can nearly always do so, and that the money which is frequently misspent on alcohol, selfish pleasures, and finery, would go far, if wisely spent, to secure those

things that are necessary to well-being. The great majority of the women of a nation are also far above the extreme low-water mark of great poverty, and it is rather with ignorance and apathy that we have to contend than with an absolute difficulty in the provision of the necessaries of life.

The woman who hopes to bring into the world a healthy and vigorous infant must begin, from the first moment that she recognizes her condition, to live even more strenuously than she might do under other circumstances according to the laws of physiological righteousness —she must obtain as much sunshine and fresh air as possible.

For the assistance of the poorer classes there is no doubt a need for wise and helpful legislation, and meanwhile for the charitable efforts of those women who are themselves more fortunately placed; but even for these, our poorer sisters, much might be done by kindly and sympathetic instruction by women who themselves know and value the advantages of fresh air, pure water, and wholesome food.

One almost unutilized source of help in the education of public opinion lies in the power that women undoubtedly possess of placing such a matter intelligently and sympathetically before the public. There are thousands of women who are eager to be of service in the world, and who know in an inexact manner something of the evils we deplore and of the remedies that we ought to apply. A little better realization of the true facts connected with the causation of tuberculosis, and of the means that are necessary to prevent its ravages, would make these women a band of enthusiastic missionaries scattered over the length and breadth of the country, carrying with them, and able to distribute to others, the knowledge that is essential to the stamping out of this group of diseases.

The time is evidently coming when the women of the working classes will have been taught the rudiments of applied physiology and hygiene in our schools, and it is fair to hope that with the knowledge will come the desire for better things. Meanwhile there are a few very obvious improvements that might be made in their lot, and that would tend to diminish the incidence of tubercle and other diseases during the pregnant state, and would therefore go far to improve the prenatal condition of their offspring.

Dietary.—A proper choice of food and skill in preparing it is sadly to seek among our working population. The institution of cooking centres for the instruction of elder girls and young women should be promoted. The food suitable to the expectant mother consists chiefly of milk, bread, rice, and other cereal foods, and vegetables, with a small proportion of meat. Apart from the badness of our cooking, the chief fault in the feeding of the nation is the undue proportion and wasteful use of meat. It is rare for English housewives of the poorer classes to

obtain either the nourishment or the pleasure that ought to be derived from a small allowance of animal food. In this respect our Continental neighbours easily excel us. Again, it must be remembered that alcohol is not a food; on the contrary, its chief influence is to spoil the digestion and to injure the tissues. It is responsible for a large proportion of the cases of consumption in women. It acts on them both directly and indirectly: directly by the undermining of their powers of resistance, and indirectly by rendering them unfit to work, and thereby depriving them of the means of procuring warmth, light, and food, which are the best prophylactics against tubercle.

Occupation.—There are certain occupations that distinctly predispose women—and *a fortiori* pregnant women—to infection by tubercle. The employment of women in factories and laundries, in hot and ill-ventilated workshops, predispose them to this disease. The rooms in which they work are generally hot and crowded and particularly ill-ventilated; they are therefore liable to chill when they turn out into the streets, in many cases without sufficient clothing. Their vitality is thus greatly lowered, and it is not surprising that their tissues should be found to afford a suitable breeding-ground for various infections, and especially that of tubercle.

Overcrowding.—With regard to overcrowding, a very large proportion of the families belonging to the poorest classes are forced to herd together—men, women, and children in one room, or at the most in two rooms. They are deprived of the necessary amount of fresh air, the atmosphere that they breathe is overladen with the products of respiration, and the air, being frequently rebreathed, becomes very badly fitted to sustain life. People living under such miserable conditions are, of course, not likely to take any reasonable care of their health, or to maintain the common decencies of life. It is almost impossible to keep rooms clean when there is no chance of the housewife having them empty for ever so short a time; the dust and dirt, laden with the germs of disease, and amongst them the germs of tubercle, accumulate in the corners of the rooms, in cracks and crevices of all kinds, and perhaps most of all in the dirty rags which do duty for floor-covering or bed-clothing.

The want of adequate warmth, clothing, and food lowers the vitality and resisting power of the body, and renders it a suitable soil on which all manner of infections grow. Beyond all things, the want of light and fresh air favours the development of tubercle, for it is common knowledge that the bacillus of tubercle, although remarkably hardy in some respects, and retaining its vitality after drying, freezing, and exposure to considerable heat, is yet particularly vulnerable to the influence of sunshine and light. Sunshine and light, however, are amongst the most difficult things to secure in the crowded slums of great cities.

Clothing.—Among the other evils of poverty which predispose to the development of tubercle must be reckoned the insufficiency of clothes, which causes constant chills and catarrhs, together with more serious diseases of the throat and lungs, and in this way also the soil is rendered favourable for the growth of the bacillus of tubercle. Of course, the old theory that exposure to cold literally brought on pneumonia, consumption, and other diseases, has been proved to be untrue, but they remain potent factors in that want of vitality which is the indirect cause of such diseases. The clothes of the pregnant woman should be light, warm, and loosely fitting.

Ventilation.—In another way the want of suitable food, clothing, and adequate warmth favours the development of tubercle, because people whose vitality has been thus lowered are exceedingly unwilling to have the necessary ventilation by means of open windows. It is comparatively easy for the rich, who have large rooms, big fires, warm clothing, and good food, to enjoy and profit by the open window. Where rooms are large enough and sufficiently well ventilated for the air to be adequately purified without sensible draughts all is well, but the smaller the room, the more evident is the inflowing river of cold air, and the worse an individual is clothed and fed, the less is he able to resist chill.

The Prevention of Tuberculosis in the Nursery, with Reference to Infants and their Attendants.

To consider first the case of the infant. Just as the cry of the statesman is "Back to the land," so should the cry of the nursery be "Back to the breast." It is old knowledge now that the breast-fed infant has an enormous advantage over his bottle-fed brother—an advantage that not only greatly improves his chances of life, but which also secures to him the equally important blessings of future health and strength. The babe that is fed upon cow's milk runs a constant risk of swallowing the germs of tubercle, and it is therefore not at all surprising that the form taken by that disease in infants is frequently that of intestinal, peritoneal, or generalized tuberculosis, rather than the pulmonary form, which is commonest in grown-up people.

There are signs that doctors, the public, and legislators are gradually awakening to the national importance of a supply of pure milk, and that we are daily recognizing more clearly the difficulties that surround this question.

Milk is often drawn from tuberculous cows, and where that tuberculosis affects the udders the bacilli cannot fail to be supplied with the milk. The question of the purity of milk is very far-reaching, for cows appear to be particularly liable to this disease. It becomes a matter of great importance that farmers should be taught, and should

recognize the fact, that cows, as well as human beings, require airy, well-ventilated sleeping accommodation, and adequate food and exercise. The great majority of farmers cannot be expected to realize for themselves the importance and duty of destroying tuberculous animals, and of preventing the infection spreading from the sick to the healthy; nor can they be expected to voluntarily secure the rapid refrigeration of the milk when drawn, nor to realize the care that it requires in transit, and the great necessity that exists for keeping all pails, cans, and other dairy utensils in a perfectly sterilized condition. Not unnaturally they feel that all these minute precautions handicap their trade and diminish their profits, and it is for this reason that it has become urgently necessary to have adequate legislation which may be easily and strictly enforced.

The public also might do something to protect themselves. It is true that a full analysis and bacteriological examination of milk costs money, but if a certain proportion of householders would have this examination carried out once a year the dairies distributing the milk would soon make it worth the while of the farmer to sell them none that was not absolutely free from taint.

After a time a child's diet does not consist entirely of milk, but it remains the most important constituent throughout its nursery days. Immunity from tuberculosis, like immunity from most other infectious diseases, is to a great extent secured by maintaining the health of the people at the highest possible level, therefore the prevention of tuberculosis in the nursery depends greatly on the careful selection of articles of food for the children, on their proper cooking, and on the securing of a sufficient variety.

Children's powers of digestion vary greatly, but there are certain foods which suit nearly all, and certain other foods that are equally prone to disagree. Children's diet should consist chiefly of milk, bread, butter, vegetables, fruit, eggs, fish, and a little plainly-cooked meat or poultry; such things as twice-cooked meat, shell-fish, pastry, rich cakes, and dried fruit of all kinds, should be entirely prohibited.

The ventilation and warming of the nursery are matters of the greatest importance, and inasmuch as sunshine is the greatest enemy of tubercle, the nursery should, if possible, face south, while the little people should be in the open air for as many hours as is possible during the day.

The germs of tubercle, like those of all other infectious diseases, are frequently to be found in dust and flue. This, of course, means that the nursery floor should be covered with movable rugs, and not with a carpet that can only be thoroughly cleansed once or twice a year; it also means that all hangings should be not only washable, but should frequently be washed.

Great care should be taken in the selection of children's attendants, and the important question of health should be considered as carefully as their mental and moral qualifications for the duties of governess and nurse. To secure this object it is very desirable that employers should require a certificate of physical soundness signed by a qualified medical practitioner. Our Scandinavian neighbours have set us a good example in this, as in many other instances connected with physical welfare. Tuberculosis is much less rife than it was fifty years ago, but it still exists, and therefore nursery attendants suffering from pulmonary consumption, or consumption affecting the upper air-passages, are absolute sources of danger to their charges. It is true that doctors and nurses in hospitals seldom become infected from their patients; but, then, great care is taken that the sputa are received into suitable vessels containing disinfectants and speedily destroyed; on the other hand, in the nursery the same handkerchief is not infrequently used by the adults and the children, and should any member of the party be unhealthy the infection is likely to spread. It is well known that expectorated matters are comparatively innocuous until dried, but being dried they are readily inhaled with the particles of dust, and become dangerous. All this is a strong argument in favour of selecting healthy attendants, and in securing plenty of space and fresh air in the nursery.

With regard to the commonest method of infection in children, it is generally through the alimentary canal. In the case of mouth-breathers, especially children afflicted with adenoids, swarms of bacteria are constantly drawn in. They may effect a lodgment on the tonsils, but, of course, the digestive canal is much more frequently infected by articles that are swallowed; *e.g.*, in the case of infants crawling on the ground of an infected house, they not only inhale the disease-bearing dust, but they also infect their fingers, which they immediately afterwards put into their mouths. This is one way in which babies' "comforters" are a great source of danger. The child sucks his "comforter" and drops it on the ground, possibly on the floor of a filthy omnibus; it becomes contaminated with tubercle, diphtheria, scarlet fever, and other diseases; the mother picks it up, hands it back to the babe, who forthwith sucks it again! It is a marvel that any baby who uses a "comforter" lives to grow up. If it were not for the wonderful protection afforded by healthy mucous membrane, such children must be infected many times before they are two years old. Providentally, the healthy mucous membrane of both gullet and stomach is well able to deal with ordinary infections. The secretion of the stomach is acid when the child is well, and the acidulated mucous membrane makes short work of most objects presented to its digestive capacity. Children, however, are extremely liable to attacks of indigestion and feverishness during the progress of dentition and in

the course of many childish ailments. Unluckily this is the very time at which mothers think that a "comforter" must be acceptable to the infant, and consequently the death-bearing indiarubber is chiefly in fashion at a time when the vigilance of the internal police is relaxed.

A very common form of tuberculosis in little children is tuberculosis of the mesenteric glands (tabes mesenterica). In these cases the infection has manifestly entered by the mouth. Failing to be digested in the stomach, it passes on to the bowel, and thence gains access to the lymphatics and glands of the mesentery; subsequently it will in all probability be carried to the omentum and peritoneum. Even then, however, all is not lost, for the *vis medicatrix naturæ* is great, and children have a happy knack of recovering from tuberculous peritonitis and from tabes mesenterica if their circumstances are not too unfavourable.

A little child is also very liable to acquire tuberculous disease of its abdominal organs, because it lives almost entirely on milk, and the milk, as we have seen, is too often contaminated with tubercle and many other infections.

One can never repeat too frequently that we all of us get exactly what we deserve; and if we are willing to put up with tuberculous cows that seldom enjoy fresh air and exercise; if we will put up with careless and ignorant dairy-farmers who do not take the trouble to clean their milk-pails or to refrigerate their milk; if we are willing that railway companies shall ill-treat the milk-cans, leave their covers open, and fail to provide rapid transit from the producer to the consumer; still more, if we are contented to have milk and other perishable articles of food exposed for sale without protection from flies and dirt; and if we begrudge the necessary inspection by trained officials, we must be contented to receive into our houses milk which has not only entered on the process of decomposition, but milk which simply teems with micro-organisms, foremost amongst which is the ubiquitous and greatly daring bacillus of tubercle. It is the survival of the fittest, and bacteria are apparently better able to take care of themselves than is the mass of the population.

Tuberculosis in the Schoolroom.

With the commencement of formal education certain additional considerations arise. From the age of six or seven the child's life is apt to become more sedentary, and, unfortunately, the allowance of fresh air in most of our dwelling-houses is but a poor substitute for the garden, the moor, and the sands. It is all the more necessary to take care that the school hours of little children shall be sufficiently broken up to admit of alternative play in the open air, which may be rendered more valuable by teaching them simple and suitable physical exercises.

Increased vigilance is necessary in the matter of clothing, that it shall be light, warm, and loose; their food, that it shall be adequate, digestible, and varied; that their hours of sleep shall be sufficient, the aim being to secure, at any rate, eleven hours of perfect repose.

The personnel of the schoolroom is an anxious subject; for infection is as likely to extend from the infected to the healthy in the schoolroom as in the nursery.

A few words must be said as to schoolroom furniture, a subject which has hitherto failed to obtain sufficient attention. Partly from ignorance and partly from motives of economy ordinary school desks and chairs are ill-contrived, and lead to the child sitting in cramped and awkward attitudes in such a manner as to throw its spine and pelvis out of position, the consequence being that its lungs are crowded, it fails to properly aerate its blood, and is thereby predisposed to the invasion of tubercle. Sensible school furniture can, however, be obtained from various firms in London and the provinces, who have recently devoted much time and attention to the elaboration of ideas supplied by doctors, hygienists, and other authorities.

Tuberculosis in Public Schools and Colleges.

Turning now to the wider field, it must be remarked that, although enormous sums have been spent in the erection of both Voluntary and Board schools, primary and secondary schools, adequate ventilation is but seldom attained. Growing children need a far larger proportion of fresh air than do adults, their tissue changes are more rapid, and the tissues themselves are unstable in proportion to their youth. It is a national duty to see that the sanitary conditions of schools are as little injurious as is possible to the children whose attendance there is compulsory. The questions of ventilation, lighting, and warming are confessedly difficult, but they can be dealt with satisfactorily if the necessary interest and money are both forthcoming; and considering the far greater relative cost of sickness, it would be a national economy so to build and so to alter schools that they should become what they are not now—suitable and healthy buildings.

The necessary limits of this paper prevent any discussion of details, but one little point must be mentioned. The chief agent of infection with tuberculosis and other diseases is certainly *dust*, and in all schools, gymnasia, drill-halls, etc., dust is produced with astonishing rapidity. Dry sweeping aggravates the evil, and it is necessary to contrive some means of quickly wiping the floor with damp cloths or some machine carrying moisture, similar in principle to the carpet-duster, which might be used once or twice during the day to remove this source of infection.

Another point that deserves careful consideration is the securing as

far as possible of the immediate treatment and cure of slight injuries and ailments. Although the germs of tubercle are always with us, they do not readily effect a lodgment on healthy tissues, but it has been frequently found that attacks of tuberculous disease follow bruises, sprains, and other apparently minor injuries in children who are predisposed by heredity or environment to that disease. In another great class of cases—viz., the infectious fevers—more care ought to be taken to secure rapid and complete convalescence of the sufferers. It is common knowledge that tubercle may follow attacks of whooping-cough, measles, and other childish ailments, but the true reason has not been appreciated by the public. These diseases, like many others, lower the vitality of the patients, and also frequently cause some local injury—*e.g.*, in the lungs after measles, the throat and ears after scarlet fever—hence it would appear as if measles caused pulmonary consumption and scarlet fever caused ear disease, with all its dire consequences. We are not, however, quite so helpless as would appear from this theory, for if the child suffering from measles were adequately nursed and cared for, the passing congestion of the lungs would get well without leading to consumption; and if the injury to the ear caused by scarlet fever were properly treated, the consequent cases of middle-ear disease, due to tubercle and other causes, would be comparatively few.

Another valuable prophylactic to tubercle will, we hope, be found in medical inspection of school-children. Like all other diseases, tubercle is much more easily dealt with in the earliest stages; and if it were practicable for the medical officer to a school to draft delicate children into a school where special environment was provided, many such children would grow up healthy, and they would not, as at present, be a distinct source of danger to their healthy comrades.

It is exceedingly unfortunate that this national duty, which must command the sympathy of all rightly thinking people, should have necessarily perished with the other clauses of the ill-fated Education Bill of 1906. The various forms of infectious disease, including tubercle, will continue to be rife, the healthy being constantly infected by the sick, so long as medical inspection is wholly neglected or imperfectly carried out. It is scarcely likely that school authorities, whether urban or rural, will spend money on this most necessary object until they have behind them a strong and well-informed body of public opinion. In many instances, unfortunately, the teachers of the schools are as ignorant of the necessity of medical inspection and as strongly opposed to it as are the overeconomical boards of management. That the subject is of overwhelming and immediate importance is clear enough to all those who have really studied it; and it has become a national duty for this small but well instructed body of men and women to use every means in their power, whether by writing, public speaking, or

private influence, to teach the great body of the nation. Committees should be formed. The work of various public bodies, such as the National League for Physical Education and Improvement, the Royal Sanitary Institute, the National Health Society, and many others, should be co-ordinated and strengthened. There is money in the coffers of the nation, and there are thousands of men and women asking what they should do with their unemployed money and energies. All these should be interested, encouraged, and set to work to instruct the public, and to generate that volume of public opinion without which governments are powerless and the best legislation is without effect.

From all that one has heard and seen, and as an outcome of the careful thought bestowed both by men of science and practitioners on the huge problem of tuberculosis, it is evident that a great responsibility lies on those who rightly understand this problem to make its factors known to the public in general. When we consider the heavy toll of death, and the still heavier toll of disease and incapacity that is levied on the population during the most valuable years of life, we cannot fail to realize our responsibility in this matter. Much has been done by the profession, but learned papers and accurate scientific observations do not teach the public, and all hope of reform in this as in other sanitary matters must come from the people themselves. What we can do, and do effectually, is to endeavour to educate the masses, so that they may be more likely to recognize the insidious beginnings of disease, and become both more able and more willing to cheerfully carry out many measures of social reform, which ought not to be looked upon as the dreams of philanthropists only, but as the bounden duty of a civilized and patriotic nation.

THE RELATIVE PREVALENCE OF ABDOMINAL TUBERCULOSIS IN CHILDREN IN GREAT BRITAIN AND AMERICA.

By JOHN THOMSON,

M.D., F.R.C.P.E.,

Physician to the Royal Hospital for Sick Children, Edinburgh.

Some years ago my attention was drawn by Dr. David Bovaird of New York to the striking fact that abdominal tuberculosis in children, which is regarded here as one of the commonest of maladies, is quite a rare disease in the United States. He has since stated[1] that, in a single morning in the Edinburgh Children's Hospital, he was shown

[1] Transactions of the Second Annual Meeting of the American National Association for the Study and Prevention of Tuberculosis, p. 608. Press of the New Era Printing Company, Lancaster, Pa. 1906.

more cases of this condition than he had seen in New York during ten years of hospital and dispensary work.

A study of American medical literature on the diseases of children, and of such statistics of British and American hospitals for children as I have been able to consult, seems fully to confirm Dr. Bovaird's statement as to the surprising difference in frequency of this condition in Great Britain and in America. The object of the present note is merely to give the following statistics illustrating this, and to draw attention to it as a matter of some interest and importance, and one which certainly calls for further investigation.

ROYAL HOSPITAL FOR SICK CHILDREN, EDINBURGH.

	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	Average.
Number of in-patients admitted	1,154	1,219	1,361	1,398	1,533	1,597	1,504	1,596	1,844	2,114	1,532
Percentage of abdominal tuberculosis	3·63	3·75	2·57	4·36	2·73	3·63	4·98	3·82	3·14	3·20	3·57
Percentage of tuberculous meningitis	3·29	2·87	2·42	2·21	2·02	1·63	2·12	1·12	1·57	1·27	2·05

ROYAL HOSPITAL FOR SICK CHILDREN, GLASGOW.[1]

	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	Average.
Number of in-patients admitted	691	744	741	714	738	854	996	941	1,125	1,075	882
Percentage of abdominal tuberculosis	4·05	4·30	3·91	3·92	5·28	4·58	4·32	5·10	5·24	4·46	4·51
Percentage of tuberculous meningitis	2·17	2·28	1·21	2·24	2·03	1·63	2·00	2·76	1·60	3·49	2·14

HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET, LONDON.

	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	Average.
Number of in-patients admitted	1,946	2,067	1,962	1,690	2,111	2,236	2,403	2,537	2,876	3,068	2,289
Percentage of abdominal tuberculosis	0·66	1·11	1·32	1·71	1·46	1·61	2·03	2·24	2·60	1·98	1·67
Percentage of tuberculous meningitis	1·49	0·72	1·52	1·88	1·27	1·11	1·16	1·65	1·53	1·85	1·42

The statistics of the other London children's hospitals with regard to abdominal and meningeal tuberculosis seem to resemble those of Great Ormond Street pretty closely.

[1] Dr. George S. Middleton, who kindly supplied the materials for this table, has pointed out that during the last four years the numbers include those of the children sent to the county branch of the hospital, and that some of the cases of abdominal tuberculosis may have, therefore, been counted twice over.

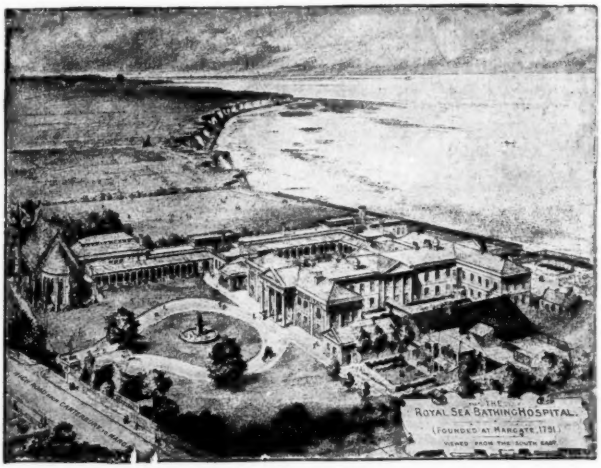
In the Children's Department, Mount Sinai Hospital, New York, in seven years (1898 to 1904) there were 2,266 patients admitted, and *only one case* of abdominal tuberculosis among them (*i.e.*, 0·044 per cent.). During the same period there were eighty cases of tuberculous meningitis (*i.e.*, 3·53 per cent.) there. In the Edinburgh Children's Hospital during the same seven years there were 10,213 in-patients admitted, including 378 cases diagnosed as abdominal tuberculosis (*i.e.*, 3·70 per cent.) and 206 of tuberculous meningitis (*i.e.*, 2·01 per cent.). In the Glasgow Children's Hospital there was an even larger percentage of abdominal tuberculosis than in Edinburgh, while that of tuberculous meningitis was practically the same. At Great Ormond Street the proportion both of abdominal and meningeal tuberculosis was considerably less than in Scotland. This is probably due mainly to there being a relatively smaller amount of all sorts of tuberculosis in London than in Scotland.

Abdominal tuberculosis seems to be rare in Canada, as well as in the United States. In two recent annual reports of the Children's Hospital in Toronto we find that out of a total of 1,759 in-patients admitted there were only two cases. In the same two years in the Edinburgh Hospital there were 3,349 patients admitted, and among them 133 cases of abdominal tuberculosis. It would, of course, be very rash to draw many conclusions from such bald and scanty statistics as those given above. I think, however, that they may fairly be claimed as demonstrating the one fact we set out to prove—namely, that the difference in the prevalence of abdominal tuberculosis in children in Great Britain and in America is surprising, and that its causes are worthy of further study.

INSTITUTIONS FOR THE TUBERCULOUS.

THE ROYAL SEA-BATHING HOSPITAL, MARGATE.

THE Royal Sea-Bathing Hospital, founded at Margate in 1791, is the pioneer of British open-air institutions for the treatment of tuberculosis. It contains 150 beds, 86 of which are reserved for children. For patients confined to bed, space is provided on the verandas, so that



THE ROYAL SEA-BATHING HOSPITAL, MARGATE.

their treatment can be carried out entirely in the open air. For "up" patients there are large recreation-grounds facing the sea. The hospital has its own sea-water intake, and is well supplied with hot and cold fresh- and salt-water baths. Tents are available for patients bathing in the sea. A generous diet is provided for the patients, whose appetites are stimulated by the keen, bracing air.

The cases treated comprise tuberculous disease of the joints, those of the spine and hip predominating, enlarged glands, especially of the neck, and some cases of lupus and other skin lesions, for which a well-equipped electrical department has been installed. The treatment is of an essentially "conservative" character in joint cases, excision of the hip being practically confined to children who arrive in a debilitated condition with large abscesses; formal arthrectomies and excisions of the knee and other joints are very rarely performed. The knee-joint, if brought under notice early enough, practically never requires

operative treatment. Operations on this joint in children are almost confined to those who have undergone operations previously in Metropolitan or other hospitals; and this statement, though in a less degree, applies to all other joints. Spinal cases are seldom dealt with at a sufficiently early stage to ensure the best results; many arrive with septic sinuses, and require prolonged treatment before any improvement is noticeable. Large numbers of tuberculous glands are treated, and as most of these are caseating on arrival, they are generally subjected to complete excision, followed by rest in the open air; the average number operated on per annum is about 120. In the 1906 report 218 children are noted as having been treated, but as many of the other patients are very young adults, that number must be added to considerably.

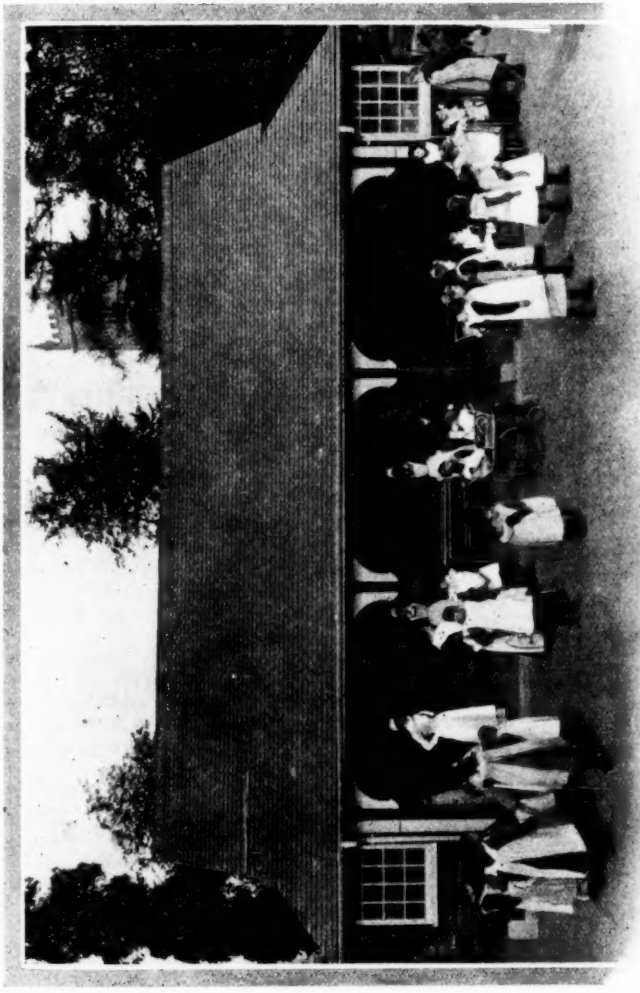
Patients are admitted by Governor's letter and payment. Cheap fares by the South-Eastern and Chatham Railway are obtainable. Further details may be obtained on application to Mr. A. Nash, Secretary, 13, Charing Cross, London, S.W.

W. G. SUTCLIFFE, F.R.C.S., *Honorary Surgeon to the Hospital.*

THE CHILDREN'S HOME AND ORPHANAGE.

THE Children's Home and Orphanage, with its headquarters at Bonner Road, N.E., has ten branches in this country and Canada, and its work is justly recognized as one of national importance. The tuberculous problem is a very practical and pressing one from our standpoint. Of the nearly 1,800 children now in the various branches of the Home, about 20 per cent. have lost one or both parents by tuberculosis, chiefly through pulmonary consumption, before their admission, and many have been deprived of father or mother from the same cause since their reception. If we include those cases whose parents, though still living, are in a more or less advanced stage of consumption, fully 25 per cent. of the children have a direct family history of tuberculosis. As special consideration is given to delicate children in the Children's Home and Orphanage, our percentage is probably higher than in similar institutions. Provision is made at the Alverstoke Branch, where a small hospital has just been erected, for a number of young, delicate and tuberculous children, and these have done remarkably well. In the Children's Hospital Branch at Chipping Norton there are eighty children, many crippled by old tuberculous disease of the spine, bones, and joints, some invalids and convalescents, and not a few in what must be considered a pre-tuberculous condition. With a view to the proper segregation of such cases, and to their more thorough hygienic treatment in accordance with the best open-air methods, the committee is about to establish, within easy reach of London, a sanatorium for children of consumptive tendency and predisposed to other forms of tuberculous disease. It is particularly desirable to deal with these children in what may be called the pre-tuberculous stage. Provision will, in the first instance, be made for some thirty-five patients. Six thousand pounds is required for a beginning, and the scheme will be proceeded with as soon as funds are in hand. It is believed that the Children's Home and Orphanage has special facilities for dealing with

tuberculous and tuberculously disposed cases, as effective "after care" can be ensured when health has been restored. Patients on leaving the sanatorium will be placed in one of the ten branches of the Home



CHILDREN'S OPEN-AIR SHELTER AT CHIPPING NORTON HOSPITAL BRANCH OF THE CHILDREN'S HOME.

under medical and nursing oversight for as long a period as may be required, and suitable employment will be found for those beyond school age. Dr. T. N. Kelynack has been appointed Honorary Physician

and Medical Adviser to the Children's Home and Orphanage, especially with a view to the development of our work in regard to the rational care and scientific treatment of consumptive and other tuberculous children.

ARTHUR E. GREGORY, D.D., *Principal.*

THE LORD MAYOR'S COUNTRY HOME FOR TUBERCULOUS CHILDREN.

IT is a curious and regrettable fact that, whilst philanthropy has long been active in relieving the lot of the crippled child, comparatively nothing has been done to reduce the number of cripples by treating in a rational and systematic manner youthful sufferers in the early stages of tuberculosis.

London, particularly, is rich in societies whose aim is to make the way of life as joyous as possible to the young people whose bodies have been, from various causes, hopelessly damaged. Yet with all these societies there has been no apparent diminution in the numbers of crippled children. What is the exact proportion of tuberculous cases amongst these cripples has not yet been ascertained, but it is certain that tuberculosis is responsible for a very large amount of permanent bodily damage.

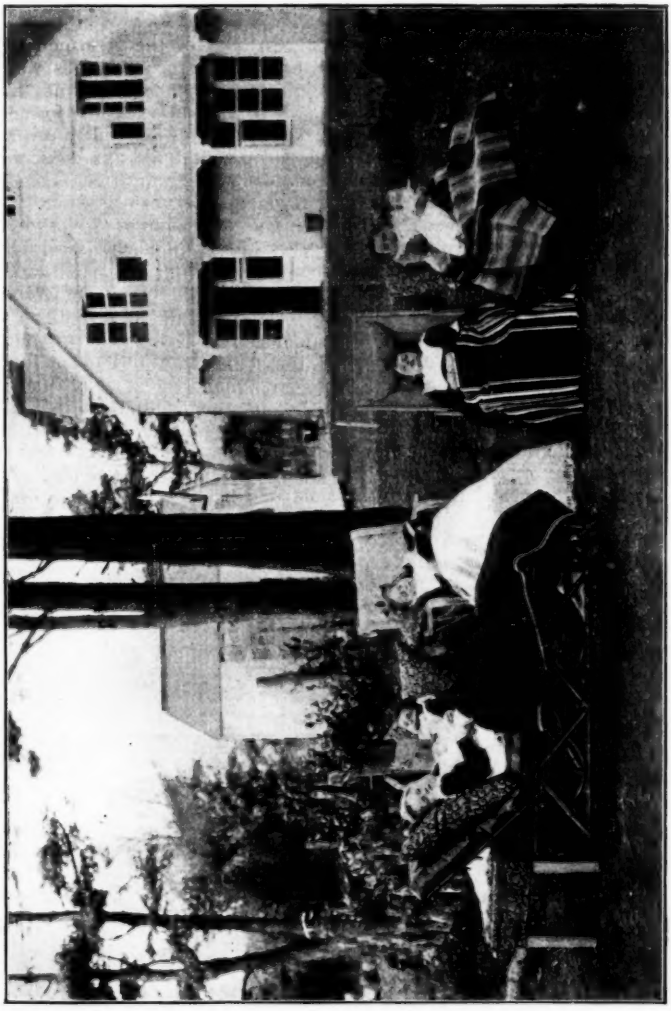
Medical opinion is daily becoming more insistent upon the necessity for removing tuberculous cases, when in the early stages of the disease, to the pure air of the country or seaside. A town hospital must of necessity be unsuitable. It has been found, too, especially on the Continent, that when these cases are treated in the early stages, the results are extraordinarily successful. In France there are upwards of 6,000 beds available for the rational treatment of this disease, whilst in England there are not 500.

Realizing through many years of close association the needs of crippled children, I am desirous of commemorating my year of office as Lord Mayor by the foundation of a Country Home to treat tuberculous children of the poor. After very careful inquiry I have come to the conclusion that the demand for such an institution is a very real and urgent one.

It is to be hoped that educational authorities will soon enforce the medical inspection of all school children; in the meantime I am most anxious to obtain close association between this new enterprise and the Schools for Physically Defective Children. One feature of the institution will be the entire absence of any time limit on the patients' residence. The period of stay will be determined solely by medical advice, based upon the individual needs of each child. The other side of the scheme will be the technical education of all inmates over fourteen years of age. It is especially necessary that these young people who spend so much time in hospitals or at home should not, when the disease has become quiescent, be thrown into a competitive world with a weakened body and unskilled hand.

Up to the present only the bare outline of the scheme as sketched here has been decided on, as it is intended to exhaust every available

source of information before crystallizing the details. The serious determination to endeavour to reduce the numbers of tuberculous



THE CHILDREN'S SANATORIUM, HOLT, NORFOLK.

children permanently lamed through intermittent attention as out-patients in our hospitals is, however, a fixed quantity, and to this end £60,000 is required.

WILLIAM P. TRELOAR, *Lord Mayor.*

THE CHILDREN'S SANATORIUM, HOLT, NORFOLK.

THE Children's Sanatorium at Holt, in Norfolk, for the treatment of consumptive children, was first projected early in 1904. Funds were raised for the purchase of land on a spot amongst pine-woods not far from the coast of our eastern seaboard. A committee was then formed to carry on the work, and at the end of 1905 it was agreed to utilize a private house adjoining the site until permanent buildings could be erected. Miss Rumball was appointed matron, and arrangements made for the boarding of children in the early stages of phthisis at an inclusive charge of 25s. a week. Dr. F. W. Burton Fanning, of Norwich, accepted the appointment of honorary consulting physician, and Dr. J. B. Gillam, of Holt, that of visiting medical officer. The first children were received in August, 1906, and up to the present time some twelve children have been under treatment. So far, in the cases taken, a large part of the cost has been borne by the committee, but this cannot be continued unless more annual subscriptions to the maintenance fund are forthcoming.

Up to the present time nearly £3,000 has been contributed. Of this amount, £1,000 is invested as endowment and £900 placed at deposit for the building fund; the remainder represents the purchase of site and laying out, the expenses of three years' developing the scheme, and the maintenance of the children since August, with a small balance in hand.

The committee hope shortly to be able to provide for sixteen children in the present premises, but they are unwilling to commence a part of the permanent building until they are assured of a wider support. Further particulars will be gladly sent from the London office, 68, Denison House, Vauxhall Bridge Road, S.W.

T. H. WYATT, M.V.O.,
Hon. Secretary.

HEALTH STATIONS.

TENBY, SOUTH WALES.

TENBY FROM ST. CATHERINE'S ROCK AND FORT.

TENBY occupies a foremost place among health stations and holiday resorts, and is particularly suited to the requirements of children. Its meteorological conditions are such as allow of an all the year round open-air life. In the first and last quarters of the year it has nearly, if not quite, the highest bright sunshine record in the kingdom. Special features are the high mean and low range of temperatures and the lack of extremes, the low maximum in summer and high minimum temperature in winter. According to the recent report of Mr. Harold L. Truscott, the Borough Meteorological Recorder, "only eight times during the past year has the thermometer fallen below freezing-point, and then only in the night-time." The annual rainfall averages 35 inches. The conveniences and safe sea-bathing are excellent. The sea temperature in the early spring months is from 50° to 53°, and

in the summer about 10° higher. The extensive sands offer special attractions for children.

The sanitary arrangements of Tenby are eminently satisfactory. Tenby is an exceptionally attractive winter station. The place is easily reached. The distance of 250 miles from London can be covered within six hours. Pleasure steamers run to adjacent ports during the summer season.

DOUGLAS A. REID, M.D.,
Medical Officer of Health.

[We are indebted to the courtesy of the Health Resorts Association for the above copyright illustration, taken from the official guide: "Tenby." By Douglas A. Reid, M.D. Published for the Corporation by the Health Resorts Association, 29, John Street, Bedford Row, London, E.C. 1907. A copy of this useful and attractive guide may be obtained on application to the Town Clerk of Tenby.]

REVIEWS AND NOTICES OF BOOKS.

HEREDITY AND TUBERCULOSIS.[1]

In an extremely interesting memoir Professor Karl Pearson dwells on the difficulty and labour of gathering together family histories sufficiently numerous, accurate, and complete to serve as adequate bases for statistical investigation. Those of us who have attempted, and abandoned in despair, the task in relation to insanity are likely to sympathize with him. Liars and experts are thought to represent progressive orders of demerit. But probably patients who answer unwelcome questions descend in many cases to depths unplumbed even by the traditional expert. Thus Professor Pearson's data indicate at first sight that phthisis is more common in the families of women than of men, which, of course, is nonsense. The families are identical, the truth, as surmised by him, being that women are more interested in, know more about, and are more ready to impart information, correct or incorrect, concerning their family histories than men. He reaches three main conclusions: (1) "The all-important genetic fact that the diathesis of pulmonary tuberculosis is undoubtedly inherited, and that the intensity of this inheritance is comparable with that found for normal physical characters in man." (2) "That the risks run, especially under urban conditions, are for tuberculosis, as for a number of other diseases, so great that the constitution or diathesis means almost everything for the individual whose life cannot be spent in self-protection." (3) The inheritance of the diathesis is not Mendelian—that is, offspring and descendants do not reproduce the character of one parent to the complete exclusion of the character of the other. The first and third conclusions are quite certainly correct. They may be confirmed by incontrovertible independent evidence. Certain races of men—for example, American Indians—are so highly susceptible to tuberculosis that since the introduction of the disease from Europe they are unable to persist in settled communities, especially under urban conditions, and more especially in such dark and ill-ventilated houses as Europeans construct in cold and temperate climates. Other races—for example, American negroes—are able to persist in Northern cities, but their death-rate is then very high. "Every other adult negro succumbs to it." Yet other races—for instance, the British—are still more resistant. Races are merely aggregates of related individuals. Obviously, therefore, the individuals of each race must tend to transmit their degrees of susceptibility to offspring and descendants. Again, Europeans have interbred with the aborigines in North and South America. In the latter a mixed race has resulted, which, presumably, blends the diatheses of both races. In the former, where the conditions are more onerous, the half-breeds and their descendants are few, and are restricted mainly

[1] "A First Study of the Statistics of Pulmonary Tuberculosis." (Draper Company's Research Memoirs.) By Karl Pearson, M.A., LL.B., F.R.S., Professor of Applied Mathematics and Mechanics, University College, London. London: 1907.

to the back settlements. They perish under the conditions found in Northern cities. Had the inheritance been Mendelian, a proportion of them would have inherited the high resisting power of the whites, and a mixed race would have been founded, as in Central and South America. The evidence for the second conclusion is less convincing. At any rate, I think the case is stated too strongly. Doubtless urban dwellers almost daily or hourly inhale or ingest some tubercle bacilli. But dosage plays an important part in infection. In some homes and occupations the liability to receive a dose of bacilli large enough to cause disease is far greater than under other conditions. Moreover, it is in just such homes and occupations that the resisting power of the individual is most lowered—that the innate diathesis is most altered by subsequent acquirement. Environment, therefore, is a considerable factor—obviously so, since an environment in which the average Briton can dwell in safety is dangerous to the American negro and deadly to the Red Indian. In the slums of our cities the conditions are dangerous even for the average Briton and deadly for the weaker members of his race. The recent fall in the mortality from phthisis has been so rapid that it cannot be attributed to an improvement in the race, but only to an improvement in the environment. The fact that many people who succumb to phthisis when they are approaching middle age escape meningeal and abdominal tuberculosis during infancy and pulmonary tuberculosis during youth is evidence that a fatal dose of bacilli is not, under ordinary circumstances, to be acquired every day by the average individual who is in normal health. Nevertheless, Professor Pearson is well within the mark when he declares that "there is an antisocial disregard for national eugenics in the conduct of medical men who can write to the public press that marriage or even intermarriage of members of tuberculous stocks is of no social detriment, provided they live with a good supply of fresh air." Under such conditions as prevail in England, no amount of air can secure immunity to the members of a susceptible stock. Often, however, it secures life sufficiently prolonged to increase the number of sufferers in the next generation.

G. Archdall Reid, M.B.

THE BLOOD IN PULMONARY TUBERCULOSIS.[1]

Dr. R. Kjer-Petersen, in his work on the numerical relations of the leucocytes in pulmonary tuberculosis, has had to meet the difficulty that the ordinary methods of counting the white corpuscles in the blood are very defective, and the normal figures for healthy men and women have not been quite accurately ascertained. According to the author, the number of leucocytes in blood taken on awaking in the morning is fairly constant for healthy men—generally between 4,000 and 5,000 in the cubic millimetre—whereas for healthy women it may vary between 3,000 and 24,000. The counts made during menstrual periods give relatively low figures; at all events, the highest figures are never found at these times. The author thinks that the daily leucocyte increase is not dependent on digestion. For ordinary clinical purposes, he recommends that leucocyte-counts

[1] "Ueber die numerischen Verhältnisse der Leukocyten bei der Lungentuberkulose." Von Dr. Med. R. Kjer-Petersen. Pp. 217. Nineteen plates. Würzburg: A. Stuber. 1906.

be made as early as possible in the day (*i.e.*, on awakening, before the first meal). The portion of the book devoted to the leucocyte-counts in cases of pulmonary tuberculosis occupies 120 of the total 217 pages, and one of the most important conclusions arrived at is that there is no invariable relation between the intensity of the pulmonary disease and the number of leucocytes in the circulating blood; the number, therefore, gives us no more definite information in this respect than does the mere height of the opsonic index. Moreover, the question of mixed infection has, of course, to be considered. Several plates of leucocyte-curves in healthy and tuberculous persons are included.

F. PARKES WEBER, M.D.

THE THERAPEUTICS OF THE SEA-VOYAGE.[1]

This learned work of Dr. Friedrich does not profess to be more than a review of the literature of the subject from revised and verified references. In the preface and the concluding pages the author gives unequivocal proof of the faith which is in him as a champion of sea-travel for the sake of health; but they are the only platform which he has reserved for himself, and he vanishes from the scene to make room for the many authorities whose views are recounted without any editorial comment. These are given in their continuous succession from Gilchrist (1756) to the present day; and, including some earlier writers, the list runs up to 260 names. Chronological sequence, pure and simple, is the elementary plan adopted in the arrangement of this vast material. There is a conspicuous absence of either sections or chapters, and we look in vain for any systematic account of the practical aspects of sea-voyages in connexion with nosology, geography, or season. In presence of this solid bulk of 325 pages, destitute of a single heading to page or paragraph, we feel as though under sentence to share the author's penalty, and to have to read through the entire series of records, without partiality or selection. Our only chance of escape is a resort to the index; but we are disappointed to find that such important subjects as Hay Fever, Bronchitis, Catarrh, Pneumonia, Malaria, Scrofula, and many others, have failed to be included in the *Sach-Register*. In spite of these serious drawbacks, we heartily welcome the book as a unique historical summary of the subject, and as a mine of information which will prove of the greatest use to the professional student of medical literature.

WILLIAM EWART, M.D.

ESSAYS ON PULMONARY TUBERCULOSIS.[2]

Dr. Crichton's brochure seeks to give the results of the most recent researches on the underlying condition in pulmonary tuberculosis. He concludes that the disease is due to a paresis of the sympathetic nervous system, as shown by loss of "tone." He discusses first the apparent antagonism between gout—where there is increased blood-pressure—

[1] "Die Seereisen zu Heil- und Erholungszwecken, ihre Geschichte und Literatur" ["Sea-voyages for Purposes of Cure and Recovery, their History and Literature]." By Sanitätsrat Dr. Edmund Friedrich, of Dresden. Berlin: Verlag von Vogel and Kreienbrink. 1906.

[2] "Pulmonary Tuberculosis: Its Predisposition, Environment, and Treatment." By David Crichton, L.R.C.S.E., L.R.C.P.E., L.F.P.S.G. Pp. 68. Dundee: John Leng and Co., Ltd. 1907.

and tuberculosis, and argues that there is in the pretuberculous state and in tuberculosis a general want of "tone," as shown by the flabbiness of the muscular, circulatory, and nervous systems. There certainly appears much in favour of this view (though the chapter on the previous health of the consumptive is not convincing). Doubtless much in the way of prevention, as well as in arrest, of consumption might be attained by acting on the suggestions of the author—viz., deep breathing, graduated muscular exercises, auto-suggestion, etc. Unfortunately, Dr. Crichton does not give us any practical illustrations in justification of his views. GEORGE A. CRACE-CALVERT, M.B.

OILS IN THE TREATMENT OF CONSUMPTION.

Dr. J. W. Wells has done well to record the interesting results of his experiments,[1] conducted in the Public Health Laboratories of the Manchester University, regarding the comparative value of cod-liver oil and cod-liver oil emulsion with glycerine and hypophosphites of lime and soda in tuberculosis. The animals selected were pigs, and the experiments were divided into four stages: (1) Preliminary stage —observation under ordinary conditions to select healthy pigs. (2) Effects of oil and emulsion on some of the animals. (3) Effects of tuberculous infection upon pigs taking oil and emulsion as compared with effect on pigs with ordinary diet. (4) Post-mortem examinations, specially noting the character of local lesions; state of lymphatic glands, kidneys, liver, spleen, and general state of carcass; also the presence or absence of tubercle bacilli. The experiments demonstrated—(1) That cod-liver oil added to the diet of pigs led to more rapid gain of weight and better nourishment. (2) That the same amount of oil, given in form of emulsion, led to an even more rapid gain in weight, and therefore the emulsion is much more efficacious than simple oil. (3) That the foregoing is true both in tuberculous and non-tuberculous pigs. (4) That pigs with tuberculosis continued to increase in weight for a long time when Scott's Emulsion of Cod-liver Oil was added to the diet; that the lesions showed signs of possible recovery and the presence of tubercle bacilli was difficult to demonstrate. The author concludes that the emulsion is a much more useful therapeutic agent than cod-liver oil. The work was carried out under the supervision of Professor Sheridan Délepine, and therefore merits careful consideration.

Dr. T. B. Keyes' monograph[2] consists of six essays. After giving a history of phthisis, it is shown that experience seems to prove that "tuberculosis has best been controlled by building up nutrition," and that this is best met by the administration of fats and oils. It is held that the pretuberculous condition is caused primarily from the non-eating and non-digestion of fatty foods. Oil injected into the tissues, it is contended, enters the circulation and increases the number and activity of the blood-cells, thus increasing the resistance of the body and enabling it to ward off disease. The author holds that oils may

[1] "A Comparative Study of the Influence of Cod-liver Oil and Cod-liver Oil Emulsion upon the Nutrition of Normal and Tuberculous Pigs." By J. W. Wells, M.D., D.P.H., F.C.S. Pp. 83. Manchester: The University Press. 1907. Price 2s. 6d. net.

[2] "Six Essays on the Cure of Consumption with Subcutaneous Injections of Oils." By Thomas Bassett Keyes, M.D. Reprint. Chicago. 1907.

be digested by the blood, and used to supply nutriment, heat, and force to the body, and that as the cure of consumption depends upon the proper supply of nutriment, we have here a means of curing the disease. The early diagnosis of pulmonary tuberculosis is discussed, the pathology of the disease reviewed, and the opinion strongly expressed that fats go to repair the damaged structures and lead to connective-tissue formation more than other food-stuffs. The essays present original ideas, but we require more proof before fully accepting all the statements presented. W. G. KINTON, M.B.

THE PATHOLOGY OF TUBERCULOSIS.[1]

Those desirous of obtaining a concise and yet comprehensive account of the pathology of tuberculosis in its manifold forms cannot do better than consult the admirable article in the latest edition of the masterly System of Medicine now appearing under the able editorship of Professor Clifford Allbutt and Dr. H. D. Rolleston. Dr. Sidney Martin's contribution to the first edition of 1897 has been revised and brought up to date, and now within the limits of some forty pages a clear and thoroughly scientific description of tuberculosis is afforded. The characteristics of the tubercle bacillus, with its special reactions, manner of growth, and micro- and macroscopic appearances of various lesions produced, are fully described. The modes and sources of infection are carefully discussed, and the difficult question of immunity is presented with discriminating care. With regard to a specific treatment of tuberculosis the view is expressed that "on the whole, the results recorded from the use of the *new tuberculin* (T. R.) are sufficiently favourable to warrant a cautious use of this preparation, in addition to recognized hygienic measures. Very small doses should be used at the beginning of a course of treatment ($\frac{1}{10000}$ to $\frac{1}{500}$ milligram), and it is advisable, in accordance with Sir A. E. Wright's advice, to be guided by the opsonic index of the blood in determining the frequency of the injections." As to . . . *urea*, it is stated that "the idea underlying the treatment is probably erroneous, and urea itself is practically inert, with the exception of a certain degree of diuretic action." A select bibliography is appended and will be of much service for reference.

TUBERCULOUS INFECTION.[2]

It is most essential that the conduct of the anti-tuberculosis campaign should be in accordance with well assured pathological knowledge. Dr. Hugh Walsham's prize essay is a scholarly thesis having a very practical bearing on measures directed to secure the prevention and arrest of tuberculosis. The possible channels of infection are fully described and their relative importance carefully discussed; and the various conditions which render the human soil peculiarly suited to the

[1] "Tuberculosis." Special article by Sidney Martin, M.D., F.R.C.P., F.R.S., and W. Cecil Bosanquet, M.A., M.D., F.R.C.P., in "A System of Medicine." Edited by Professor Thomas Clifford Allbutt and Dr. Humphry Davy Rolleston. Vol. II., Part I. London: Macmillan and Co., Ltd. 1906. Price 25s. net.

[2] "The Channels of Infection in Tuberculosis, together with the Conditions, Original or Acquired, which render the Different Tissue Vulnerable." Being the Weber-Parkes' Prize Essay. By Hugh Walsham, M.A., M.D., F.R.C.P. Pp. 150. With 16 plates. London: John Bale, Sons, and Danielsson, Ltd. 1904. Price 12s. 6d.

implantation of the tuberculous seed are well though briefly indicated. The work bears evidence of much bibliographical research and considerable pathological investigation. The illustrations are excellent. Dr. Walsham's monograph is one which no serious student of tuberculosis can afford to neglect.

THE HYGIENIC TREATMENT OF TUBERCULOSIS.[1]

Sir Hermann Weber and his son, Dr. F. Parkes Weber, have laid the whole profession under a debt of gratitude for their new and most masterly work on climatology and balneotherapy. Their comprehensive volume practically comprises the substance of their previous publications bearing on the subjects discussed, but as far as possible brought up to date. The general principles of climatotherapy and balneology are thoroughly set forth, and particulars given of all the more important European and North African health stations, and details of the places where spa treatment may be employed. Although of necessity in a measure a compilation, the work is a monument of patient research, and bears abundant evidence of most careful personal investigation. There is much in these pages to interest the student of tuberculosis. A special chapter is devoted to "Sanatorium Treatment," wherein is described its evolution and principles of management. A further chapter deals with the climatic arrangements necessary for the hygienic control of pulmonary tuberculosis, in a manner which will prove invaluable to the physician requiring assistance in the selection of suitable health stations for consumptives and the subjects of other tuberculous affections. There is an excellent bibliography and a most complete index. This work will rank as our most authoritative guide to all matters pertaining to climatic stations and spas, and for purposes of reference should be within the reach of every physician.

THE CARE OF THE CHILD.

"Les enfants sont ce qu'on les fait." The truth of this dictum is slowly being realized. The protection of childhood is the first and essential requisite for national wellbeing. The publication of numerous new works dealing with all phases of child life, both in health and disease, affords welcome evidence of the demand for accurate information concerning the problems pertaining to childhood. Among very complete and systematic standard works, reference must be made to the new edition of the valuable text-book of Dr. Ashby and Professor G. A. Wright.[2] It stands foremost among modern treatises devoted

[1] "Climatotherapy and Balneotherapy: The Climates and Mineral Water Health Resorts (Spas) of Europe and North Africa." By Sir Hermann Weber, M.D., F.R.C.P., Consulting Physician to the German Hospital, London, the Royal National Hospital for Consumption, Ventnor, and the Mount Vernon Hospital for Consumption and Diseases of the Chest, Hampstead and Northwood; and F. Parkes Weber, M.D., F.R.C.P., Physician to the German Hospital, London, and to the Mount Vernon Hospital for Consumption and Diseases of the Chest. Pp. 833. London: Smith, Elder and Co. 1907. Price 15s. net.

[2] "The Diseases of Children, Medical and Surgical." By Henry Ashby, M.D., F.R.C.P., Physician to the Manchester Children's Hospital, Lecturer and Examiner in Diseases of Children in the Victoria University; and G. A. Wright, B.A., M.B., F.R.C.S., Consulting Surgeon to the Children's Hospital, Professor of Surgery in the Victoria University. Fifth edition. Pp. 920, with 241 figures. London: Longmans, Green and Co. 1905. Price 21s. net.

to pediatrics. It is a book which should have a prominent place among the most valued and best used possessions of every practitioner. Tuberculosis, in its manifold forms, receives full consideration; an admirable coloured plate of tuberculous ulceration of the neck appears as a frontispiece.

A second edition has been issued of the admirable manual of Dr. Ralph Vincent,[1] in which he deals with the problems of nutrition of the infant and the perplexities of substitute feeding, and fully explains the method introduced by Dr. T. M. Rotch, of Boston, a method still ill-understood in this country, but which is slowly revolutionizing ideas and practice both here and in America. Dr. Vincent has been wise to publish details concerning a series of typical cases of infantile malnutrition treated at the Infants' Hospital,[2] so affording just that explicit and detailed information required by the practitioner.

Captain Robert Blackham's concise and simply expressed manual of "hints"[3] on the management of childhood is a direct, practical guide which might with advantage be placed in the hands of any intelligent woman.

Dr. John Grimshaw's most informing "Health Talks"[4] are addressed to those who have the care of infants and small children, and we quite agree with the opinion expressed by Dr. E. W. Hope in his "introduction" that they "will be of great use to those whose business it is to give lectures or explanations on the means to be adopted to preserve the baby in a healthy state."

Miss Blanche Tucker, as Inspectress of Elementary Schools and Organizer of the Teaching of Cookery and Laundry Work to the Liverpool Education Committee, although seeing things as they are, knows how to convey instruction regarding things as they should be. We commend her little work[5] to teachers and all endeavouring to prepare girls for the duties and dignity of motherhood.

Professor Edward Curtis has written an able work on Personal and Domestic Hygiene,[6] which, dealing in an attractive and suggestive manner with such subjects as breathing, eating, drinking, clothing, exercise, and the like, will be of particular service to teachers, but may be studied with advantage by parents and all self-respecting persons.

Wisely selected and judiciously conducted exercise may be of con-

[1] "The Nutrition of the Infant." By Ralph Vincent, M.D., M.R.C.P. Second edition, revised and enlarged. Pp. 321. London: Baillière, Tindall and Cox. 1904. Price 10s. 6d. net.

[2] "Clinical Studies in the Treatment of the Nutritional Disorders of Infancy." By Ralph Vincent, M.D., M.R.C.P. Pp. 83. London: Baillière, Tindall and Cox 1906. Price 3s. 6d. net.

[3] "The Care of Children: Practical Hints for Mothers and Nurses at Home and Abroad." By Robert J. Blackham, D.P.H., Captain R.A.M.C. Revised and enlarged edition. Pp. 84. London: The Scientific Press, Ltd., 28, Southampton Street, W.C. 1906. Price 1s. 6d. net.

[4] "Health Talks about Children: An Appeal for the Child." By John Grimshaw, M.D., B.S., D.P.H., M.R.C.S., etc. Pp. 83. Birkenhead: Brimmell's Printing Works, Oxton Road. 1906. Price 1s. net.

[5] "Notes on the Care of Babies and Young Children: For the Use of Teachers." By Blanche Tucker. With an introduction by Dr. E. W. Hope. Pp. 68. London: Longmans, Green and Co. 1907. Price 1s.

[6] "Nature and Health: A Popular Treatise on the Hygiene of the Person and the Home." By Edward Curtis, A.M., M.D., Emeritus Professor of Materia Medica and Therapeutics, Columbia University, New York. Pp. 313. New York: Henry Holt and Company. London: George Bell and Sons. 1906. Price 5s. net.

siderable service, not only in developing natural powers of resistance to tuberculosis and other diseases, but in aiding the actually afflicted to win back health. Those who have charge of children will obtain much help from the manual of Dr. Hartelius[1] on Swedish exercises.

Among the many volumes, now being issued in quick succession, aiming at the popularization of the principles of hygiene, "The School of Health"[2] should not be overlooked. It is an attractive, suggestive, unconventional presentation of facts and fundamentals which parents, teachers, and all in any way responsible for the management of the hygienic home and direction towards an ideal life, would do well to study. The illustrations will make it welcome to children of all ages.

The disquieting report of the recent Inter-Departmental Committee on Physical Deterioration has stimulated scientific study of all matters relating to school life. Mr. W. Langbridge has prepared a very useful and suggestive "Physique Register,"[3] so arranged that the average physical development of each year-group of children in a school may be readily compared with that of other year-groups in the same school, and also with that of year-groups of the whole nation. The work is one which we commend to the attention of medical officers of schools and teachers.

MANUALS FOR MEDICAL PRACTITIONERS.

The family practitioner is usually the first to be consulted in regard to suspected tuberculosis. It is essential, therefore, that he should be well equipped with sound knowledge as to the best methods of modern diagnosis and the principles and practices of present-day treatment. Dr. Arthur Latham's well-ordered manual,[4] now in its third edition, is well adapted to the requirements of the general practitioner, and also contains much of interest to the sanatorium physician. The new work on opsonins is discussed, and the opinion expressed that "it is unwise to make clinical deductions in the diagnosis or treatment of pulmonary tuberculosis from this method at present." The system of employing graduated work is enthusiastically described, for the author has been converted by the results obtained at Frimley. He prints the "grades of labour" twice in different parts of his book, and says, "in view of the results obtained by Dr. Paterson at the Frimley Sanatorium, we must take a wider view of what forms of exercise are permissible when the patient is making steady progress on graduated walking exercise."

[1] "Home Gymnastics for Young and Old." By T. J. Hartelius, M.D., Principal Lecturer at the Royal Gymnastic Central Institute, Stockholm. Translated and adapted from the Swedish by C. Löfving. Fifth edition, revised. With a prefatory note by Arthur A. Beale, M.B. Pp. 94, and 31 illustrations. London: Sir John Pitman and Sons, Ltd. 1906. Price 1s. 6d.

[2] "The School of Health: A Guide to Health in the Home." By Alfred B. Olsen, M.D., and M. Ellsworth Olsen, M.A., Editors of *Good Health*. Pp. 402. Illustrated. London: International Tract Society, Ltd., 451, Holloway Road, N. 1906. Price 5s.

[3] "Physique Register." By W. Langbridge. Pp. 29. London: The Education Supply Association, Ltd., 42, Holborn Viaduct. Price 2s.

[4] "The Diagnosis and Modern Treatment of Pulmonary Consumption, with Special Reference to the Early Recognition and the Permanent Arrest of the Disease." By Arthur Latham, M.A., M.D., F.R.C.P., Senior Assistant Physician at the Brompton Hospital for Consumption and Diseases of the Chest. Third edition. Pp. 257. London: Baillière, Tindall and Cox. 1907. Price 5s. net.

The advice given concerning the administration of alcohol in tuberculosis is somewhat vague and old-fashioned, and not in accordance with the best modern practice. Clinical experience, moreover, does not uphold the opinion expressed that the offspring of tuberculous parents "are more resistant to the disease than other children, and this fact may to some extent account for the diminishing mortality from tuberculosis." Many will not approve the advice that "as soon as the disease has become arrested, tubercle bacilli have disappeared from the sputum, and constant medical supervision is no longer required, consumptive individuals may be advised to marry, provided that they are able to live under suitable conditions." The book is one which should be read by all responsible for the early recognition and effective treatment of consumption.

In studying tuberculosis it is desirable to remember the many pathological features in which it resembles syphilis, and in dealing with a tuberculous case the clinician must bear in mind the possibility of a mixed infection. The relationship of syphilis to tuberculosis requires further investigation. Dr. C. F. Marshall's masterly monograph,[1] the most up-to-date and comprehensive treatise on syphilis in the English language, should be studied by every medical practitioner, and is to be particularly commended to all who have to deal with syphilitic and tuberculous patients. A section is devoted to a consideration of the association of syphilis and tuberculosis. The work is in every way one of exceptional merit.

Intrathoracic surgery is still to a large extent *terra incognita*. Dr. Ricketts has done good service in compiling available knowledge relating to the surgery of the heart and lungs.[2] The author's own clinical observations and experiments are of much suggestive value. Considerable labour has been expended over the bibliography, and the volume is one which must occupy a permanent place among works of reference. It is to be regretted, however, that the author has not given to the surgical aspects of intrathoracic tuberculosis that attention which we think they merit. The plates are numerous and well executed.

The new edition of Mr. Gadd's concise and convenient pocket synopsis of the British Pharmacopœia[3] will increase its well deserved popularity among students, practitioners, and pharmacists.

PREPARATIONS AND APPLIANCES.

THERAPEUTIC PREPARATIONS.

For a disease so varied in its manifestations, and often so chronic and intractable in its course, as tuberculosis, it is hardly to be wondered at that the drugs recommended for its treatment are simply numberless. Much discernment and discriminating care must be exercised in the selection of all therapeutic preparations introduced for the relief of the consumptive and the betterment of all tuberculous sufferers.

Amyl Nitrite as an agent in the control of hæmoptysis was recommended by Dr. Francis Hare in the first number of this journal, and has since been strongly advocated by Dr. G. A. Crace-Calvert as "the best drug to administer first in any case of hæmorrhage."[1] Our own experience quite justifies this opinion. Very convenient capsules of amyl nitrite, encased in cotton-wool and silk and containing from 1 to 6 and 10 minims, can now be obtained,[2] and we have no hesitation in saying that no sanatorium or hospital should be without these valuable aids in the management of hæmoptoic cases.

Phytin,[3] a white, tasteless, and odourless powder, is a new organic phosphorous compound consisting of calcium and magnesium phosphates with oxymethylene diphosphoric acid, and is said to be of service in tuberculosis and other wasting diseases. Fortassan is a combination of phytin with milk-sugar which we have found is readily taken by tuberculous children.

Heroin Hydrochloride[4] is a most valuable sedative for the useless and ineffectual cough of some phthisical cases, and for such proves a very effective substitute for morphia and codeine, but it should be given with discrimination, and not allowed as a mere routine linctus.

Guaiacol and its derivatives have found much favour in the treatment of pulmonary and other forms of tuberculosis; guaiacol carbonate or duotal, guaiacol sulphonate of potassium or thiocol, guaiacol cinnamate or styracol, and other preparations of this group, have all been extensively employed. Styracol,[5] the cinnamic acid ether of guaiacol, is readily split up in the organism, yielding guaiacol, which in many phthisical cases is certainly beneficial.

An Elixir Creasoti Co.,[6] containing creasote, codeine, terpin-hydrate, and formate of soda, recently introduced, we have found of distinct service in the management of consumptive cases.

[1] "Amyl Nitrite in Hæmoptysis." By George A. Crace-Calvert, M.B. The *Lancet*, April 6, 1907.

[2] Glass capsules of amyl nitrite are supplied in boxes at 2s. 6d., by W. Martindale, 10, New Cavendish Street, London, W.

[3] Prepared by the Society of Chemical Industry in Basle. London agency: 27A, St. Mary-at-Hill, E.C.

[4] Prepared by the Bayer Co., Ltd., 19, St. Dunstan's Hill, London, E.C.

[5] Prepared by Knoll and Co., of Ludwigshafen-on-Rhine. London office: 27A, St. Mary-at-Hill, E.C.

[6] Prepared by Messrs. Hough, Hoseason and Co., Salford, Manchester.

Martindale and Westcott's "Extra Pharmacopæia,"[1] justly popular and most convenient and comprehensive, is now in its twelfth edition, and forms an indispensable reference manual to all new as well as long-established therapeutic preparations. It is a work which no physician can afford to be without, and is indeed a veritable pharmaceutical and therapeutical *multum in parvo*.

DIETETICS.

BENGER'S FOOD,[2] since its first introduction on the initiative of the late Sir William Roberts, has found universal favour as a nutrient of the greatest value in tuberculous and other cases requiring a nutrient which can be rapidly digested and absorbed. When used with milk it forms an ideal food in acute tuberculosis, and in the digestive derangements which oftentimes make the management of even chronic cases difficult. It is of the greatest service in the feeding of many tuberculous children. This preparation should always be available in every sanatorium and children's hospital.

HYGIAMA[3] is a preparation which is used extensively in Continental sanatoria, and deserves to be better known in this country. We have used it with much satisfaction, and can thoroughly recommend it. It is prepared from condensed milk, and contains cereals, cocoa, malt, and sugar. It is of high dietetic value, of exceptionally pleasing flavour, rich in stimulant action, easily assimilated, forms a nutritious beverage, or may be used in other forms, and is likely to be popular wherever it is introduced.

CHEESE is a cheap, concentrated, and easily digestible form of food, the value of which is apt to be overlooked. Those responsible for the dietary of a sanatorium should study Dr. Francis T. Bond's interesting and suggestive brochure,[4] and might well try the CHEESE CREAM preparations supplied by the Severn Valley Diary Products Company.[5]

Fry's COCOA AND CHOCOLATE preparations[6] have justly won world-wide distinction. They are valuable foods for children, and of real service for many tuberculous adults. The MALTED COCOA,[7] which is a combination of pure cocoa extract with Allen and Hanbury's Concentrated Extract of Malt, is a highly nutritive and palatable restorative, which may be strongly recommended for consumptives and tuberculous children.

MOSELEY'S FOOD[8] is a delicious cereal preparation which we have used with most satisfactory results, and would commend as particularly useful for delicate children and consumptive patients.

[1] "The Extra Pharmacopœia of Martindale and Westcott." Revised by W. Harrison Martindale, Ph.D., F.C.S., and W. Wynn Westcott, M.B., D.P.H. Twelfth edition. Pp. 1045. London: H. K. Lewis. 1906.

[2] Prepared by Benger's Food, Ltd., Otter Works, Manchester.

[3] Supplied by Dr. Theinhardt's Food Co., Ltd. English Agent: C. Hohmann, 6, Catherine Court, Seething Lane, London, E.C.

[4] "The Claims of Cheese as a Substitute for Meat." By Francis T. Bond, M.D., B.A., F.R.S.E., M.O.H., South-West Gloucestershire Combined District. Pp. 35. Gloucester: Sanitary and Œconomic Association, Ltd., 21, George Street. Price 6d.

[5] The Severn Valley Dairy Products Co., Stonehouse, Gloucestershire.

[6] Full particulars from Messrs. J. S. Fry and Sons, Ltd., Cocoa Works, Bristol

[7] Obtained from Messrs. Allen and Hanbury's, Plough Court, 37, Lombard Street, London, E.C.

[8] Manufactured by Foods, Ltd., Stockport.

CORN FLOUR,[1] the refined starch of Indian corn or maize, when prepared with pure, sweet milk, forms a useful food, which is eagerly taken by many children and invalids.

Mr. Eustace Miles is an enthusiastic and yet scientific food reformer, whose PROTEID FOOD specialities we have investigated and can thoroughly recommend.[2] They might be used in schools and sanatoria, as well as in the home, with great advantage. Housewives and cooks should use the ingenious DOUBLE PAN COOKER, a simple and effective means for cooking vegetables without waste and with increased palatability.

HYGIENIC REQUISITES.

The sanatorium and the hygienic home, however well designed and located, require assiduous attention and many aids if they are to be kept in a condition suited to the particular needs of the inmates. In discussions on the construction of open-air establishments, the need of efficient maintenance is apt to be overlooked.

The sanitary treatment of floors merits thorough study. Teak is undoubtedly the best wood available for floors and doors. All floors should have a smooth, hard, durable, waterproof surface, and present a pleasing appearance. The "RONUK" SANITARY POLISH[3] we have referred to in a former number as an ideal preparation. The manufacturers of this excellent polish undertake the systematic care of the floors of hospitals and other institutions and private houses. Skill in the use of the "RONUK" FLOOR POLISHING BRUSH can be readily attained by servants, and the small domestic pattern is well suited for employment by ward-maids and servants of the household. Even the deal floors of schools, studios, and ordinary houses may be stained and polished and made to meet artistic and hygienic requirements by "RONUK" SPECIAL STAINING. We have tested these stains and find them thoroughly effective. They only need to be generally known to be extensively used. For many country sanatoria and the rapidly multiplying country homes they will prove invaluable.

Fire is a very real danger which no one can afford to overlook, and should always be prepared to meet it. A very ingenious, convenient, and inexpensive HAND FIRE EXTINGUISHER[4] has recently been invented, which will probably soon be recognized as an indispensable for every home and each sanatorium.

Much disaster befalls children from the employment of inflammable clothing. Flannelette, extensively used on account of its warmth and general comfort, durability and cheapness, is particularly dangerous. A reliable substitute—the invention of Professor W. H. Perkins, jun., F.R.S.—has been introduced in NON-FLAM,[5] a fabric similar in appear-

[1] Prepared by Messrs. Brown and Polson, of Paisley, and 6, Bouverie Street, London, E.C.

[2] Full particulars from the Eustace Miles Restaurant Co., Ltd., 40 to 42, Chandos Street, Charing Cross, London, W.C.

[3] Full particulars of "Ronuk" preparations may be obtained from "Ronuk," Ltd., Portslade, near Brighton. London depot: 86, York Road, Lambeth, S.E.

[4] The "Prana" Sparklet Chemical Hand Fire Extinguisher, nickel-plated, complete with charge, price 7s. 6d., is supplied by Aerators, Ltd., Upper Edmonton, London, N.

[5] Manufactured by Messrs. Whipp Bros. and Todd, Ltd., Aytoun Street, Manchester.

ance and characters to ordinary flannelette, but having fire-resisting properties which render it non-inflammable even after repeated washings. It is an excellent material for children's underwear and night garments, and deserves to be known and used in all hospitals and sanatoria.

APPLIANCES FOR THE OPEN-AIR LIFE.

Open-air treatment, with its free exposure to air, wind, damp, and cold, plays havoc with conventional complexions, and many skins suffer much from roughness, redness, chapping, and other minor cutaneous inconveniences. For such, and also as a reliable antiseptic and healing dressing, IZAL CREAM[1] will be found of considerable service.

Since every rose has its thorn, it may be admitted that the open-air life is not without some few disadvantages, and not the least come from the attacks of midges, mosquitoes, and other insects during summer-time. Many children suffer greatly from insect bites. As an effective preventive, "MUSCATOL"[2] deserves to be known, and will, we think, be popular in sanatoria and approved by many travellers.

The patient who would lead the hygienic life must not be careful above measure regarding climatic conditions. A rational hardening is undoubtedly beneficial for most, if not all. This does not necessarily entail discomfort, as many imagine. The wearing of heavy overcoats is to be discouraged, and especially by readily winded and easily fatigued tuberculous cases. For such the light, durable, comfortable, and pleasing Waterproof "Lytemac" coat, introduced by Messrs. G. Pratt and Co., cannot be beaten. We have thoroughly tested one of these excellent protectors, and can thoroughly recommend them.[3]

THE SIESTA HAMMOCK[4] will prove a popular lounge for sanatoria and all outdoor dwellers. It is simple in construction, light in weight, strong and durable, readily portable, easily adjusted, pleasing in appearance, reasonable in price, and affords an efficient means for securing absolute rest for the body and protection for the head. We have practical experience of this excellent hammock, and can strongly recommend it.

Among the many ingenious fountain pens recently introduced, Moore's "NON-LEAKABLE" PEN[5] will be of special service to the sanatoria patient and all those practising the open-air life, and yet requiring "pen and ink" which shall always be available. This pen can be carried in the pocket free from all risk of leakage. It is easily filled without unscrewing, can be placed in any position, requires no clips and no pouches, and is in every way most satisfactory.

A strong, compact, roomy, and inexpensive cardboard box-case[6]

[1] Izal Cream and other useful Izal preparations are manufactured by Newton, Chambers and Co., Ltd., Thorncliffe, Sheffield. London offices: 19, Great George Street, S.W.; and Thorncliffe House, 331, Gray's Inn Road, W.C.

[2] Muscatol is supplied in bottle from 1s. to 21s. by Mr. Frank A. Rogers, 327, Oxford Street, London, W.

[3] The "Lytemac" Waterproof coat is obtainable from Messrs. G. Pratt and Co., Indian and Colonial Outfitters, 148, Leadenhall Street, E.C. Price 21s. post free.

[4] Supplied by the Siesta Co., Harrowgate. Price of hammock, with canopy complete, £1 4s. 9d.

[5] Supplied by Moore's Non-leakable Fountain Pen Co., Federation Works, Lancaster Street, Birmingham. Price from 12s. 6d.

[6] The "V.S.S. Box-All," size $12\frac{1}{2} \times 8\frac{1}{2} \times 2$ inches, is supplied by the Education Supply Association, Ltd., 42, Holborn Viaduct, London, at 6s. per dozen, net.

intended for the use of children, in which they may orderly and hygienically store their school material, deserves the notice of all responsible for the care of children, and might well be introduced into sanatoria and open-air schools, where it would prove of great convenience to patients and scholars living the open-air life.

DISINFECTANTS AND ANTISEPTICS.

In sanatorium treatment and the conduct of anti-tuberculous measures germicides occupy a prominent place. Among the many clamouring for favour, CYLLIN[1] and the preparations manufactured by Jeyes' Sanitary Compounds Company deserve a foremost place. Cyllin has a guaranteed germicidal value, is less toxic than carbolic acid and many other popular disinfectants, is very inexpensive, thoroughly effective, and convenient for hospital and sanatorium work. Drs. E. Klein and Francis J. Allan have shown that Cyllin is a most reliable agent for the disinfection of tuberculous sputum. In a former issue we referred to the use of Cyllin as a convenient and helpful inhalant.

DENTAL HYGIENE.

Oral sepsis from a neglect of dental hygiene exists in large numbers of tuberculous cases, and, unfortunately, is a condition often overlooked and left untreated. Every consumptive patient should be taught the principles and practice of the hygiene of the mouth. A good tooth powder should be used at least twice daily. Among preparations recently brought to our notice we can recommend IZAL TOOTH POWDER[2] and EUCALYPTOL TOOTH POWDER,[3] both excellent cleansing and antiseptic dentifrices.

As a particularly pleasant mouth-wash for women and children, and consisting of well-known antiseptics, essential oils, and aromatics, "KUMA"[4] may be recommended.

A STEAM INHALER.

Moist heat by means of an inhaler often gives great relief in affections of the respiratory tract, but considerable difficulty is usually experienced in maintaining a uniform application for any time. This is effectually overcome in Dr. SAENGER'S INHALER,[5] which has been submitted to us, and which we understand is being used in several Continental sanatoria. It is strong, simple in construction, readily managed, provides a uniform supply of vapour which can be suitably medicated, and is inexpensive. After careful testing, we recommend it as a very helpful appliance.

[1] Manufactured by Jeyes' Sanitary Compounds Co., Ltd., 64, Cannon Street, London, E.C.

[2] Supplied by Messrs. Newton, Chambers and Co., Ltd., Thorncliffe, Sheffield.

[3] Manufactured by the "Oleusaban" Eucalyptus Co., 38, Camomile Street, London, E.C.

[4] Supplied by Cosmo Chemical Co., Ltd., 62, Farringdon Street, London, E.C.

[5] Supplied by Bruno Kallenbach, 46, Wilson Street, Finsbury Square, London, E.C.

CASE-BOOKS AND CLINICAL CHARTS.

Both for the requirements of private and institutional practice, convenient time and labour-saving case, chart, and appointment books are nowadays simply indispensable. Messrs. George Pulman and Sons, Ltd.,[1] have expended much care and ingenuity to meet the requirements of medical practitioners. Their "CRANFORD" MEDICAL CASE-BOOK (price 10s. 6d.) is a well-arranged, neatly printed, and strongly bound volume, with diagrams, numbered pages, and alphabetical index, suited to the needs of consulting practice or sanatorium work. The LOOSE-LEAF APPOINTMENT BOOK (price 8s. 6d.), with its strong covers, quickly adjusted springs, and readily detached separate leaves, arranged for quarter of an hour appointments, should be appreciated by many hard-worked consultants and practitioners. The "ARBORETA" MEDICAL CASE-BOOK (Price 3s. 6d.), of pocket size, is constructed on the loose-leaf system, has diagrams of front and back of chest and abdomen, temperature chart, and room for short notes—a very convenient arrangement for the visiting physician. This firm also supplies the "PERFECT" FILE (price 2s. 9d.), a very satisfactory means for keeping notes, charts, and the like in orderly array.

The time and trouble saving appliances of the Library Bureau are well known, and many will be interested in their new PATENT BINDER,[2] which is a simple and cheap means whereby case-papers, charts, letters, and the like, can be preserved in order and ready for immediate reference.

Excellent temperature charts, well suited to the needs of sanatoria cases, are now prepared by several firms. The novel temperature chart invented by Dr. Lloyd Smith, and employed at the Crossley Sanatorium, is printed by Messrs. J. Wright and Co.,[3] who also supply a variety of case-papers and clinical diagrams.

Messrs. Wodderspoon and Co.'s charts have been familiar objects to several generations of medicals, and still find favour. Special charts have been introduced for tuberculous cases.[4]

Excellent charts designed for sanatorium work may also be obtained from Mr. H. K. Lewis,[5] the Scientific Press,[6] and Messrs. Warren Hall, and Lovitt.[7] The latter firm have supplied us with one of their "simple reference files," a particularly strong and convenient means for keeping case-papers and charts in alphabetical order, which should be of considerable utility in hospital and sanitorium work.

[1] Messrs. George Pulman and Sons, Ltd., Thayer Street, Manchester Square, London, W.

[2] Supplied by the Library Bureau, Ltd., 10, Bloomsbury Street, London, W.C., in four colours, 4to size, 3s. 6d. per dozen.

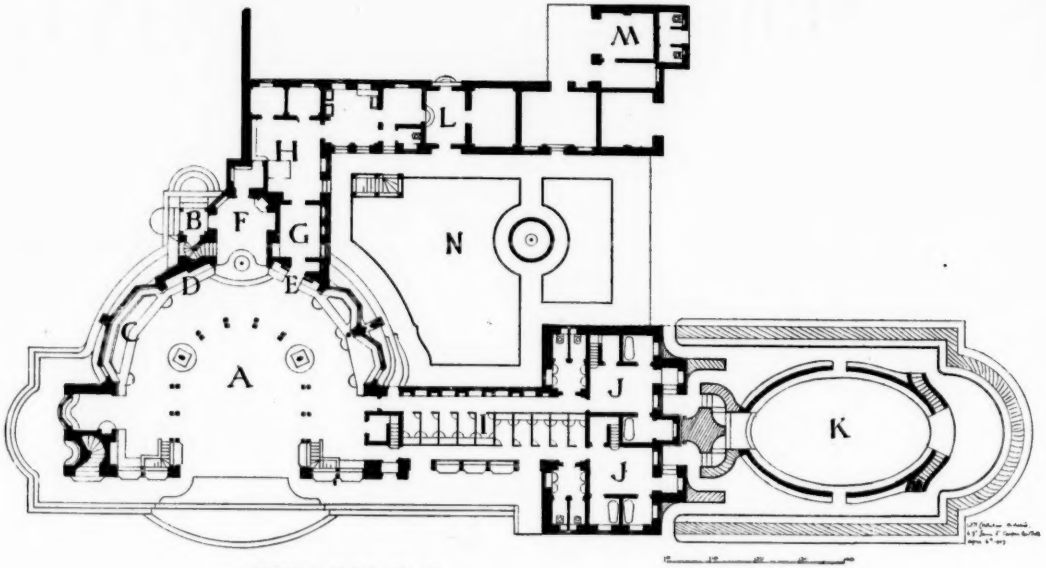
[3] Specimens and full particulars from Messrs. J. Wright and Co., *Medical Annual* Office, Stonebridge, Bristol.

[4] Samples from Messrs. Wodderspoon and Co., 6, Gate Street, Lincoln's Inn Fields, London, W.C.

[5] Mr. H. K. Lewis, Gower Street, London, W.C.

[6] The Scientific Press, Ltd., 28 and 29, Southampton Street, Strand, London, W.C.

[7] Messrs. Warren Hall, and Lovitt, 88 and 89, Camden Road, London, N.W.



GROUND FLOOR PLAN. SCALE OF FEET

OPEN-AIR SCHOOL AT LETCHWORTH.

A—Living corridor, with beds to draw down from the arches, and awning over centre.
B—Entrance porch.
C—Dining table.
D—Bookcase.
E—Dresser.
F—Hall, with organ entresol and fountain.
G—Communal pantry.
H—Kitchen.
I and J—Dressing-rooms.
K—Swimming-bath.
L—Side entrance.
M—Stable.
N—Grass court with fountain.

NOTES AND NOTICES.

AN OPEN-AIR SCHOOL.

If open-air management for the sick has not accomplished everything that could be wished, it has at all events directed attention to the value of the hygienic life for the preservation of the healthy. A conspicuous proof of such contention is afforded in the open-air school now being erected at Letchworth, in Hertfordshire, by Miss Lawrence, who has kindly supplied the following note regarding her enterprise: "If open-air living has the effect of eliminating — or, at least, of keeping in quiescence — tuberculous disease, why should not the open-air life be adopted by every one? Why wait till the tubercle bacillus has started on its evil work before this very simple method is adopted? I have determined to attempt an experiment at Letchworth. The accompanying ground-plan of the open-air school which I am erecting suggests a fresh line of development in the construction of dwelling-houses and places for public instruction and entertainment. The large living cloister is covered in on the top, but open at the sides. A hot-air chamber beneath the flooring, with hot pipes and open fires, provides warmth. There is a large swimming-bath, and all provision is made for the rational conduct of a simple and healthy education. The school is not intended for children, but for adults, and it is proposed to receive students intending to take up courses of study on subjects bearing upon the science of living—physiology, psychology, sociology. When the school is not thus engaged it will be utilized for the purpose of conferences, when there will be free discussion on these subjects. Opportunity will be offered on these and other occasions for public instruction."

DISCUSSIONS ON TUBERCULOSIS.

The Second International Congress on School Hygiene will be held in the University of London from August 5 to 10, 1907. Dr. Arthur Newsholme, Mons. le Dr. J. Courmont, and Dr. Schumberg will open a discussion on "The School and its Relation to Tuberculosis." An exhibition of school buildings and furnishing appliances is also arranged. Full particulars may be obtained from the Royal Sanitary Institute, Parkes Museum, Margaret Street, W.

An important Conference of Representatives of the City and Metropolitan Borough Councils on the question of taking measures to limit the spread of tuberculosis was held at the Town Hall, Paddington, W., on June 6, 1907, and for which Dr. Reginald Dudfield, Medical Officer of Health for the Borough of Paddington, prepared a valuable "Statistical Memorandum" which all sanitarians would do well to consult.

SANATORIA FOR CONSUMPTIVE WORKERS.

The first sanatorium erected by the "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis" was opened by Princess Christian, the President of the Association, on April 30, 1907, at Benenden in the Weald of Kent.

Dr. T. Orme Dudfield, Medical Officer of Health for Kensington, W., has just issued an informing report on "The Prevention of Consumption," in which he shows the urgent need for a suitable sanatorium for the Metropolitan consumptive poor in the early stages of the disease. He advocates the establishment of a central authority, and suggests the Metropolitan Asylums Board as eminently qualified for such duties, and further recommends the employment of the new but empty "Southern Hospital" at Carshalton, in Surrey, as a sanatorium for London's consumptives. It is to be hoped that this matter will at once be thoroughly considered by the Local Government Board.

NOMENCLATURE.

Greater accuracy and uniformity in nomenclature is most desirable in all records dealing with tuberculosis. The American National Association for the Study and Prevention of Tuberculosis has taken a step in the right direction in unanimously adopting the following resolution: "That in the interests of clearness and uniformity of nomenclature the Association employ in its official publications the term *tuberculous* to refer to lesions or conditions caused by the tubercle bacillus, and the term *tubercular* to describe conditions resembling tubercles, but not caused by the tubercle bacillus." It will be well if this suggestion is universally followed.